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CATALOGUE

OF

FOSSIL MAMMALIA.

PART III.

CATALOGUE

OF THE

FOSSIL MAMMALIA

IN THE

BRITISH MUSEUM,

(NATURAL HISTORY)

CROMWELL ROAD, S.W.

PART III.

CONTAINING

THE ORDER UNGULATA, SUBORDERS PERISSODACTYLA, TOXODONTIA, CONDYLARTHRA, AND AMBLYPODA.

BY

RICHARD LYDEKKER, B.A., F.G.S., ETC.

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PREFACE.

The present Part of Mr. Lydekker's Catalogue completes the Order Ungulata, with the exception of a single group, the Proboscidea. This comprises so large a series of specimens that it has been considered desirable to reserve it for the next Part.

Only four species in Part III., namely *Tapirus americanus*, *Equus caballus*, *Rhinoceros sondiacus*, *Rh. unicornis*, are at present existing; the remaining 78 species being all extinct. Amongst these will be found many of the most ancient members of the Order, such as *Lophiodon*, *Hyracotherium*, *Pachynolophus*, *Palæotherium*, *Anchilophus*, *Coryphodon*, *Tinoceras*, *Dinoceras*, *Hyracodon*, *Cadurcotherium*, all of which appear in the Eocene formation.

Rhinoceros is the only genus recorded in the Catalogue which has persisted on from the Eocene to the present time.

Many ancestral forms of the Horse, Tapir, and Rhinoceros will be found recorded in this Part of the Catalogue.

HENRY WOODWARD.

British Museum
(Natural History),
Department of Geology,
April 5, 1886.

INTRODUCTION.

As the present Part does not call for any addition to the introductory observations published in the two preceding Parts, I have only to again express my thanks to the Director of the Geological Survey of India for the loan of woodcuts; and to offer the same to Professors A. Gaudry, O. C. Marsh, and E. D. Cope, for permission to reproduce some of the beautiful woodcuts illustrating their respective works. My obligations to Mr. W. Davies are as great in this as in the preceding Parts.

The *Gualteris Collection*, consisting of specimens from the Pleistocene of Italy, and originally belonging to Cardinal Gualteris, was purchased previous to 1836.

The *Sharp Collection* was purchased in 1876 from Mr. S. Sharp, of Dallington, Northampton.

RICHARD LYDEKKER.

Harpenden,
5th April, 1886.

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[Existing species are denoted by an asterisk.]

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ABBREVIATIONS OF SERIALS QUOTED IN PART III., AND NOT GIVEN IN THE LISTS IN PARTS I. AND II.

[Where not otherwise stated, the works are in 8vo.]

An. Mus. Buenos Ayres.—Anales del Museo Nacional de Buenos Ayres. 4to. *Buenos Ayres.*

Ann. Sci. Indust. Mid. France.—Annales des Sciences et de l'Industrie du Midi de la France (Société de la Statistique). *Marseilles.*

Ann. Sci. Lit. Auvergne.—Annales scientifiques, littéraires et industrielles de l'Auvergne. *Clermont-Ferrand.*

Landwirt. Jahrb.—Landwirthschaftlichen Jahrbuch. *Berlin.*

Mém. Soc. Géol. France.—Mémoires de la Société Géologique de la France. 4to. *Paris.*

Mem. Soc. Ital. Sci. Nat.—Memorie della Società Italiana di Scienze Naturali. 4to. *Milan.*

Nat. Hist. Rev.—The Natural History Review. *London.*

Pal. Abhand.—Palæontologische Abhandlungen (Dames and Keyser). 4to. *Berlin.*

Zeitschr. für Min.—Zeitschrift für Mineralogie (Leonhard). *Frankfort.*

Zool. Anzeig.—Zoologischer Anzeiger (Carus). *Leipsic.*

CORRIGENDA TO PART II.

Page 48, note 3, *after* p. *add* 89.

„ 82, note 5, *for* Beiträg. *read* Handbuch.

„ 159. In dentition of *Gelocus*, *for* I. $\frac{2}{3}$ *read* I. $\frac{?}{3}$.

Additional Corrigendum to Part I.

Page 259. In dentition of *Leporidæ*, *for* Pm. $\frac{2}{2}$ *read* Pm. $\frac{3}{2}$.

CATALOGUE

OF

FOSSIL MAMMALIA.

PART III.

Order UNGULATA.

Suborder *PERISSODACTYLA.*

The present suborder and the Artiodactyla[1], which are sometimes grouped together under one name (Ungulata Vera[2], Diplarthra[3], or Clinodactyla[4]), are differentiated from the other suborders of the Ungulata by the structure of the carpus and tarsus. In the carpus the scaphoid is supported by the magnum, and the latter (together with the unciform) supports the lunar; while in the tarsus the cuboid extends inwardly to articulate with the astragalus, which is deeply grooved. All the bones of both the carpus and tarsus strongly interlock, and the structure of these joints is more complex than in any of the other suborders. No known form has more than four functional digits to either foot; and the feet are always digitigrade. The jugal forms the anterior part of the zygomatic arch, and the

[1] *Suprà*, Part II.

[2] Flower, 'Encyclopædia Britannica,' 9th edit. vol. xv. p. 427 (1883). The term Ungulata Vera is not equivalent to the other terms, since, while Flower (*loc. cit.*) divides the Ungulata into two primary groups only, Cope (*inf. cit.*) and Marsh (*inf. cit.*) recognize four such primary groups. In the Cat. Vert. Anim. Mus. Roy. Coll. Surg. part ii. Mammalia (1884), Flower discards all divisions above those of subordinal value; this arrangement being adopted in the present Catalogue.

[3] Cope, Proc. Amer. Phil. Soc. vol. xx. p. 444 (1882).

[4] Marsh, 'Monograph of the Dinocerata' (Rep. U.S. Geol. Surv. vol. x.), p. 177 (1884).

brain is well developed[1]. The suborder Perissodactyla, as far as it is at present known, is distinguished from the Artiodactyla by the distal surface of the astragalus being truncate, instead of ginglymoid; by the third digit being symmetrical in itself and larger than either of the others, instead of the third and fourth being equal in size and arranged symmetrically on either side of a line drawn between them; by the presence of a third trochanter to the femur; and by the non-articulation of the fibula with the calcaneum. As, however, the limb-bones of some members of the Order are still unknown, it is possible that future discoveries may engender some modifications of these distinctive characters[2].

Family TAPIRIDÆ.

The last three upper premolars are as complex as the true molars; the lower molars are simply bilophodont, and there is no third lobe to $\overline{\text{m. 3}}$.

Genus **TAPIRUS,** Cuvier[3].

The writer follows Flower (Cat. Vert. Anim. Mus. Roy. Coll. Surg. part ii. Mammalia, p. 385 [1884]) in including *Elasmognathus*, Gill, in this genus.

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{3}$, M. $\frac{3}{3}$. In the existing species there are four digits in the manus and three in the pes. The first upper premolar is preceded by a milk-tooth[4].

Tapirus arvernensis, Devèze and Bouillet[5].

This species is allied to *T. indicus*.

Hab. France and Italy[6] (? England).

41141. Cast of the mandible, showing the complete cheek-dentition of either side. The original is from the Upper Pliocene of Perrier, near Issoire (Puy-de-Dôme), France.

Purchased, 1865.

[1] For other characters, see Marsh, *op. cit.* p. 175.

[2] For other characters of the two suborders, see Flower, 'Encyclopædia Britannica,' 9th edit. vol. xv. pp. 427, 429 (1883).

[3] Tab. Elément. d. l'Hist. Nat. p. 152 (1798). The genus also has the pre-Linnean authority of Brisson.

[4] *Vide* Proc. Zool. Soc. 1882, pp. 774–775.

[5] 'Essai sur la Mont de Boulade' (1827), *teste* Gervais.

[6] See Forsyth-Major, Quart. Journ. Geol. Soc. vol. xli. p. 2 (1885).

Tapirus elegans, Pomel[1].

Syn. *Tapirus vialetti*, Aymard[2].

This species is described as being one seventh smaller than the preceding; but its right to distinction is perhaps doubtful.

Hab. France.

21895, 21903. Two right upper molars; from the Upper Pliocene of Vialette (Haute-Loire), France.
Croizet Collection. Purchased, 1848.

21902. The right astragalus; from the Upper Pliocene of Vialette.
Croizet Collection. Purchased, 1848.

The following specimens from the Red Crag of Suffolk indicate a form considerably smaller than T. priscus (*with which one of them has been identified*), *and may be identical with one or other of the two preceding forms*:—

28999. (*Fig.*) An imperfect right upper true molar; from Woodbridge. Described and figured by Owen in the Quart. Journ. Geol. Soc. vol. xii. p. 233, fig. 9, as *T. priscus*. *Purchased*, 1854.

29592. A right upper true molar.
Hastings Collection. Purchased, 1855.

44167, 46571. Four upper true molars. *Purchased*, 1873–75.

36563. The third left upper premolar; from Sutton.
Purchased, 1853.

46572. Three lower cheek-teeth. *Purchased*, 1875.

Tapirus priscus, Kaup[3].

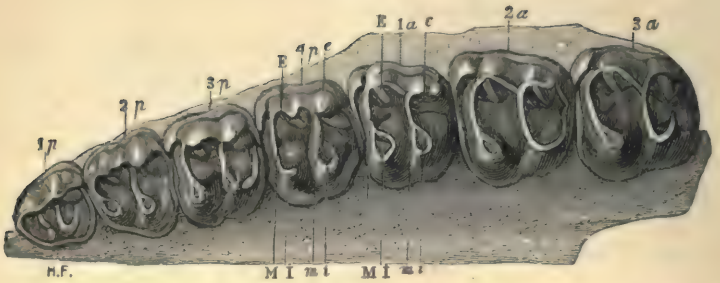
Syn. (?) *Tapirus antiquus*, Kaup[4].

This species appears closely allied to *T. indicus*, and it has been suggested ('Palæontographica,' vol. xv. pp. 170–171) that it is specifically identical with *T. arvernensis*, but it is generally of considerably larger size; if the two be identical, the latter name has the priority. The upper dentition is figured in the accompanying woodcut (fig. 1).

Hab. Europe.

[1] Catalogue Méthodique, p. 84 (1853).
[2] Quoted in Gervais's 'Zool. et Pal. Françaises,' 2nd edit. p. 103 (1859). In Meyer's 'Palæologica,' p. 89 (1832).
[4] Oss. Foss. d. Darmstadt, part ii. p. 4 (1833).

Fig. 1.



Tapirus priscus.—The left maxilla, showing all the cheek-teeth; from the Upper Miocene of Eppelsheim, Hessen Darmstadt. $\frac{2}{3}$. 1 *p*, 2 *p*, 3 *p*, 4 *p*, premolars; 1 *a*, 2 *a*, 3 *a*, true molars; E, *e*, outer, I, *i*, inner, M, *m*, middle columns[1]. (From Gaudry's 'Enchaînements.')

40633. (*Fig.*) The palatal portion of the cranium, showing the whole of the cheek-dentition of both sides, together with the left canine and the third incisor of both sides; from the Upper Miocene of Eppelsheim, Hessen Darmstadt. This specimen is described and figured by H. v. Meyer in the 'Palæontographica,' vol. xv. p. 174, pl. xxv., and is also figured in De Blainville's 'Ostéographie,' genus *Tapirus*, pl. vi. *Purchased*, 1867.

198 (O. C.). Cast of a fragment of the left maxilla, containing pm. 1 and pm. 2. The original is from Eppelsheim, and is figured by Kaup in the Oss. Foss. d. Darmstadt, pt. ii. pl. vi. fig. 2; pm. 1 appears to be a *dent de remplacement*. *Purchased.*

198 a (O. C.). Cast of a fragment of the left maxilla of a young individual, containing mm. 1 and mm. 2. The original is from Darmstadt, and is figured by Kaup, *op. cit.* pl. vi. fig. 3. *Purchased.*

40634. (*Fig.*) The greater part of the left ramus of the mandible of an immature individual; from the Upper Miocene of Eppelsheim. This specimen is described and figured by Von

[1] In this and the other figures with the same lettering the component parts of the teeth are named in accordance with the structure of a typical bunodont tooth. In the lophiodont type the two outer columns have united to form the longitudinal ridge, while the middle and inner columns have united in pairs to constitute the two transverse ridges.

Meyer, *op. cit.* p. 173, pl. xxvii. fig. 1, and De Blainville, *loc. cit.* It shows $\overline{\text{pm. 3}}$, $\overline{\text{mm. 4}}$, $\overline{\text{pm. 4}}$ *in alveolo*, $\overline{\text{m. 1}}$ and $\overline{\text{m. 2}}$. *Purchased*, 1867.

M. 247. The greater part of the right ramus of the mandible, showing all the cheek-teeth except $\overline{\text{pm. 4}}$; from the Upper Miocene of Eppelsheim.
Enniskillen Collection. Purchased, 1882.

M. 2627. Cast of the greater portion of the left ramus of the mandible, showing the six cheek-teeth. The original is from the Upper Miocene of Eppelsheim, and is preserved in the Museum at Darmstadt; it is figured by Kaup in the Oss. Foss. d. Darmstadt, part ii. pl. vi. fig. 1.
No history.

1247. Fragment of the mandible, containing three cheek-teeth; from the Upper Miocene of Eppelsheim.
Purchased from Dr. Kaup.

M. 2628. Cast of the left radius and the distal extremity of the ulna. The original is from the Upper Miocene of Eppelsheim. *No history.*

Tapirus americanus, Cuvier[1].

Hab. South America.

18909. Several upper and lower molars, and bones of the feet; from the caverns of Minas Geraes, Brazil. These specimens doubtless belong to Lund's *Tapirus affinis americanus*.
Claussen Collection. Purchased, 1845.

Tapirus sinensis, Owen[2].

This species is somewhat larger than *T. indicus*, with which its teeth agree in general characters, although presenting characteristic points of difference[3].

Hab. China. All the following specimens, which are the types, were obtained from a cave near Chung-king-foo, Sechuen (Sze-chuen), China, and were purchased from R. Swinhoe, Esq., in 1870.

41928. The second left upper true molar. Described by Owen in the Quart. Journ. Geol. Soc. vol. xxvi. p. 427.

[1] Règne Animal, 1st ed. vol. i. p. 242 (1817).
[2] Quart. Journ. Geol. Soc. vol. xxvi. p. 426 (1870).
[3] See Koken, Pal. Abhand. vol. iii. pt. ii. pp. 34–39 (1885).

41929. The third right upper true molar. Described and figured (*Fig.*) by Owen, *op. cit.* p. 427, pl. xxviii. fig. 9.

41930. The third (?) left upper premolar. Described and figured (*Fig.*) by Owen, *op. cit.* pp. 426–427, pl. xxviii. fig. 8.

41931. The first right lower true molar. Described and figured by (*Fig.*) Owen, *op. cit.* p. 428, pl. xxix. fig. 5.

41932. The second left lower true molar. Figured by Owen, (*Fig.*) *op. cit.* pl. xxix. fig. 4.

41933. The third left lower premolar. Described and figured by (*Fig.*) Owen, *op. cit.* p. 427, pl. xxix. fig. 6.

41940. Fragments of molars.

Family LOPHIODONTIDÆ.

The upper true molars are more complex than the premolars; the lower molars are bilophodont or subcrescentoid; $\overline{\text{m. 3}}$ generally has a third lobe, but it is absent in *Hyrachyus*. There are usually four digits in the manus and three in the pes; but in *Triplopus* (which Cope refers to a distinct family) there are but three in the manus.

Genus **LOPHIODON,** Cuvier[1].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{3}$, M. $\frac{3}{3}$. In all specimens that the writer has seen the first premolar is absent; the lower molars are simply bilophodont.

Lophiodon tapiroides, Cuvier[2].

Syn. *Palæotherium tapiroides*, Cuvier[3].

This is the second largest species of the genus.
Hab. Europe.

11820. Cast of a fragment of the right maxilla, showing $\underline{\text{m. 2}}$ and $\underline{\text{m. 3}}$. The original is from the Middle (?) Eocene of Buchsweiler (Bas-Rhine), Alsace, and is described and figured by Cuvier in the 'Ossemens Fossiles,' 2nd edit. vol. ii. pt. i. p. 206, pl. vii. fig. 3.
Mantell Collection. Purchased, 1836.

[1] Ossemens Fossiles, 2nd edit. vol. ii. pt. i. p. 176 (1822).
[2] Ann. d. Muséum, vol. vi. p. 56 (1805). *Palæotherium*; but subsequently transferred to *Lophiodon*.
[3] *Loc. cit.*

29546. The germ of the third right upper true molar; from the Eocene of Buchsweiler.

Hastings Collection. *Purchased*, 1855.

11838. Cast of the germ of the second right upper true molar. The original is probably from Buchsweiler. The length of the outer surface is 0,041.

Mantell Collection. *Purchased*, 1836.

11843. Cast of the germ of the third right upper true molar. The original is probably from Buchsweiler.

Mantell Collection. *Purchased*, 1836.

M. 2425. The third right upper true molar; from the Eocene of Egerkingen, Switzerland. *Purchased*, 1885.

43419. Fragment of the left maxilla, containing the three premolars; from the Upper Eocene of the Aveyron Valley (Tarn-et-Garonne), France. The teeth appear to agree very closely with those figured by Rütimeyer in the Denkschr. schw. Ges. Nat. vol. xix. art. 3, pl. ii. figs. 16–20; in the distinct V formed by the union of the anterior and posterior ridges they differ from the premolars of *L. lautriciensis*, Noulet (*L. rhinoceroides*, Rüt.), described by Filhol in the Ann. Sci. Géol. vol. viii. art. 1, pp. 129, 130. The length of the space occupied by the three teeth is 0,090.

Presented by E. Packard, Esq., 1872.

11820 a. Cast of the anterior portion of the right ramus of the mandible, showing the canine, three premolars, and $\overline{\text{m. 1}}$. The original is from the Eocene of Buchsweiler, and is figured by Cuvier, *op. cit.* fig. 1.

Mantell Collection. *Purchased*, 1836.

11863. Cast of the distal extremity of a left humerus, perhaps belonging to this species. The locality from which the original was obtained is not known.

Mantell Collection. *Purchased*, 1836.

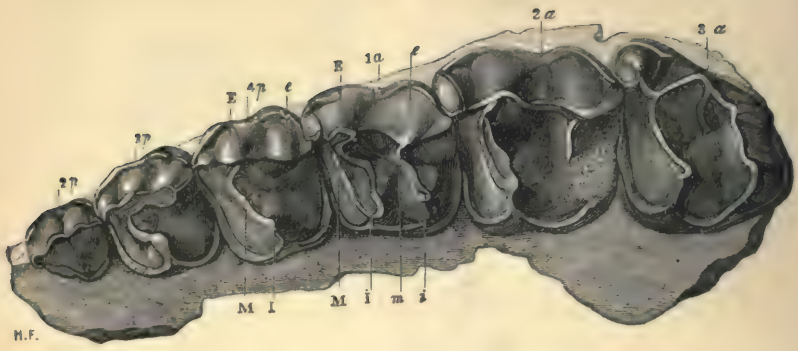
Lophiodon isselensis, Fischer[1].

This species is somewhat smaller than the preceding, and about one third larger than *Tapirus indicus*. The upper dentition is figured in the accompanying woodcut (fig. 2).

Hab. Europe.

[1] Synopsis Mammalium, p. 413 (1829).

Fig. 2.



Lophiodon isselensis.—The left maxilla, showing all the cheek-teeth; from the Middle Eocene of Issel (Aude), France. $\frac{2}{3}$. Letters as in fig. 1 (p. 4). (From Gaudry's 'Enchaînements.')

26824. The crown of the second right upper true molar; from the Middle Eocene of Argenton (Indre), France. The length of the outer surface is 0,038.

Pomel Collection. Purchased, 1851.

26826. A lower cheek-tooth; from the Middle Eocene of Argenton.

Pomel Collection. Purchased, 1851.

Lophiodon parisiensis, P. Gervais [1].

Gaudry ('Les Enchaînements, &c.—Mammifères Tertiaires,' p. 69) includes in this species the smaller specimens from Cuyse. It appears doubtful if *L. medius*, Fischer ('Synopsis Mammalium,' p. 413 [1829]) is really distinct [2]. The species is somewhat smaller than *L. isselensis*.

Hab. Europe.

M. 2629. Fragment of the right maxilla, containing m. 2 and m. 3; from the Lower Eocene of Cuyse-la-Motte, near Epernay (Marne), France. The teeth agree very closely with those

[1] Zool. et Pal. Françaises, 1st edit. vol. i. p. 54 (1848–52).

[2] The type of this species is the upper molar from Argenton, figured in the 'Ossemens Fossiles,' 2nd ed. vol. ii. pt. i. pl. x. fig. 9. Rütimeyer (Denkschr. schw. Ges. Nat. vol. xix. art. 3, pl. iii. fig. 36) figures under this name a molar agreeing very closely in size with the types of *L. parisiensis*; while under the latter name (fig. 27) a much larger tooth is figured.

figured by Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xvii. figs. 3–5, but are rather smaller. *No history.*

M. 2427. The first or second right upper true molar; from the Calcaire Grossier (Middle Eocene) of the Paris Basin. This tooth is larger than the second molar of the last specimen. *Purchased*, 1885.

26827. The first or second right upper true molar; from the Middle Eocene of Paris. The length of the outer border is 0,028. *Pomel Collection. Purchased*, 1851.

M. 2428. Two upper premolars; from the Middle Eocene of Paris. *Purchased*, 1885.

29629. Cast of the mandible of a subadult individual, showing the nearly complete dentition. The original is from the Middle Eocene of Nanterre, near Paris, and is figured in De Blainville's 'Ostéographie,' Genus *Lophiodon*, pl. ii., under the name of "*Lophiodon* de Nanterre"; it is preserved in the Paris Museum of Natural History. There are six cheek-teeth.

Presented by the Paris Museum of Natural History.

26825. Fragment of the left ramus of the mandible, with m. 2 and m. 3; from the Lower Eocene of Cuyse-la-Motte. The last tooth agrees very closely with the one figured by Gervais, *op. cit.* fig. 6.

Pomel Collection. Purchased, 1851.

Lophiodon, sp. *a.*

Gervais (Zool. et Pal. Françaises, 2nd ed. p. 124, pl. xxxv. fig. 17) indicates a second form from the Middle Eocene of the Paris Basin, smaller than *L. parisiensis.* The length of the external border of the type m. 2 is 0,020. The species may perhaps be identical with one of those already named.

Hab. France.

M. 2429. The first right upper true molar, probably belonging to this form; from the Calcaire Grossier (Middle Eocene) of the Paris Basin. The length of the external border is 0,0185. *Purchased*, 1885.

M. 2426. Two upper premolars, probably belonging to the same form; from the Middle Eocene of Paris. *Purchased*, 1885.

Lophiodon minimus, Fischer[1].

Syn. *Pachynolophus minimus,* Gervais[2].

This small species is about the size of *Pachynolophus isselanus.*
Hab. Europe.

36836, 39837–8. The second lower true molar, the second lower (*Fig.*) premolar, and a much-worn upper premolar; from the Middle Eocene of Bracklesham, Sussex. The lower teeth are figured by Owen in the 'British Fossil Mammals and Birds,' p. 311, fig. 108.
Bowerbank Collection. Purchased, 1865.

26828. A lower premolar; from the Middle Eocene of Argenton (Indre), France. *Pomel Collection. Purchased,* 1851.

Genus **HYRACOTHERIUM,** Owen[3].

Syn. *Pliolophus,* Owen[4].
Orohippus, Marsh[5].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$. The upper molars have low crowns, with transverse ridges connecting the inner and outer cusps, the anterior ridge being interrupted; the ridges of the lower molars are interrupted, and have a tendency to a crescentoid form; the first lower premolar is separated by an interval from the second. The generic unity of *Pliolophus* with *Hyracotherium* is indicated by Flower (Cat. Vert. Anim. Mus. Roy. Coll. Surg. pt. ii. Mammalia, p. 380 [1884]), and that of the North-American *Orohippus* by Cope (Rep. U.S. Geogr. Surv. W. of 100th Meridian, Palæontology, vol. iv. pt. ii. p. 259 [1877]), both determinations being fully confirmed by an examination of the specimens in the Museum.

Hyracotherium leporinum, Owen[6].

Syn. *Pliolophus vulpiceps,* Owen[7].

This is the type species.
Hab. Europe.

[1] Synopsis Mammalium, p. 413 (1829).
[2] Zool. et Pal. Françaises, 2nd ed. p. 126 (1859).
[3] Trans. Geol. Soc. ser. 2, vol. vi. pt. 1, p. 203 (1841, read 1839).
[4] Quart. Journ. Geol. Soc. vol. xiv. p. 54 (1857).
[5] Amer. Journ. ser. 3, vol. iv. p. 207 (1872).
[6] Trans. Geol. Soc. *loc. cit.*
[7] Quart. Journ. Geol. Soc. *loc. cit.*

44058. Cast of the imperfect cranium. The original, which is the type, was obtained from the London Clay near Herne Bay, Kent, and is described and figured by Owen in the Trans. Geol. Soc. *op. cit.*, and also in the 'British Fossil Mammals and Birds,' pp. 419, 422; it is preserved in the Museum of the Royal College of Surgeons (No. 1954).

Presented by the Royal College of Surgeons, 1873.

38801. (*Fig.*) The imperfect cranium, showing the last five cheek-teeth; from débris of the London Clay in the Red Crag of Suffolk. Figured by Owen in the Geol. Mag. dec. 1, vol. ii. pl. x. fig. 2 (1865).

Presented by Rev. Prof. Henslow, 1861.

44115. (*Fig.*) Fragment of the left maxilla with the last five cheek-teeth, another of the left ramus of the mandible with the corresponding teeth, and the cast of the complete cranium and mandible; from a septarian nodule in the London Clay near Harwich, Essex. These specimens are figured by Owen, under the name of *Pliolophus vulpiceps* (of which they are the type), in the Quart. Journ. Geol. Soc. vol. xiv. pls. ii., iii. The skull appears to have been originally extracted entire from the matrix, and the cast made, after which it was cut up, and the two fragments are now alone forthcoming [1].

Presented by Rev. W. Bull, 1872.

44115 a. (*Fig.*) The right femur, imperfect distally. This specimen was associated with the last, and is figured (reversed) by Owen, *op. cit.* figs. 5–9; it was then complete.

Presented by Rev. W. Bull, 1872.

47986. The two rami of a mandible, with the crowns of the teeth hammered off, probably belonging to the present species; from the London Clay of Sheppey.

Presented by Hon. R. Marsham, 1877.

38939. Fragment of the left ramus of a mandible, showing the alveoli of most of the cheek-teeth, provisionally referred to the present species; from the London Clay of Sheppey.

Bowerbank Collection. Purchased, 1865.

[1] In the enlarged figure of the upper molars, pl. iii. fig. 2, the posterior transverse ridge is not sufficiently developed.

Hyracotherium cuniculus, Owen[1].

Syn. *Macacus eocænus*, Owen[2].

This species appears to be distinguished from the last mainly by its inferior size, the alleged difference mentioned by Owen in the structure of the upper molars being apparently due to different stages of wear.

Hab. England.

36569. Two detached upper true molars of opposite sides, and two specimens of the third right lower true molar; from the Lower Eocene of Kyson, Suffolk. The unworn upper true molar shows very clearly the interrupted anterior transverse ridge and the pronounced cingulum, considered by Marsh as characteristic of the so-called *Orohippus*.
Purchased, 1853.

36572. Several detached upper and lower premolars; from the Lower Eocene of Kyson. *Purchased*, 1853.

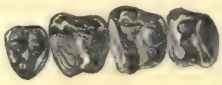
Hyracotherium angustidens, Cope[3].

Syn. *Orohippus angustidens*, Cope[4].

This species is distinguished from the other American forms by the great length of the premolars; it is of small size. The lower molars have a cingulum.

Hab. North America.

Fig. 3.



Hyracotherium angustidens.—The last four left upper cheek-teeth; from the Wasatch Eocene of North America. ½.

M. 2561. Fragment of the left maxilla, containing the last four (*Fig.*) cheek-teeth (see fig. 3); from the Wasatch Eocene of

[1] Ann. Mag. Nat. Hist. ser. 1, vol. viii. p. 1 (1841; the titlepage of the volume is dated 1842).

[2] British Fossil Mammals and Birds, p. 5 (1846).

[3] Syst. Cat. Vert. Eocene N. Mexico: U.S. Geogr. Surv. W. of 100th Meridian, 1875, p. 22; *Orohippus*.

[4] *Loc. cit.*

Big-Horn River, Wyoming, U.S.A. This and the next specimens agree with those figured by Cope in the Rep. U.S. Geogr. Surv. W. of 100th Meridian, vol. iv. pt. ii., Palæontology, pl. lxvi. figs. 1–6 (1877).

Presented by R. Lydekker, Esq., 1885.

M. 2561 a. Three fragments of the mandible, associated with the preceding. *Presented by R. Lydekker, Esq.*, 1885.

Genus **PACHYNOLOPHUS,** Pomel [1].

Syn. *Lophiotherium*, P. Gervais [2].
Propalæotherium, P. Gervais [3].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$. The upper true molars have higher ridges than in *Hyracotherium*, and are intermediate in structure between those of the latter and those of *Anchilophus*; the lower true molars are subcrescentoid. The genus occurs both in Europe and North America.

Pachynolophus isselanus (Blainville) [4].

Syn. *Palæotherium isselanum*, Blainville [5].
Propalæotherium isselanum, P. Gervais [6].

This species is of comparatively large size.
Hab. Europe.

Fig. 4.

Pachynolophus isselanus.—The third left upper true molar; from the Middle Eocene of Issel. ½. Letters as in fig. 1. (From Gaudry's 'Enchaînements').

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[1] Arch. Sci. Phys. Nat. vol. iv. p. 327 (1847).

[2] Zool. et Pal. Françaises, 1st ed. vol. i. p. 56 (1848–52). The writer follows Gaudry ('Les Enchaînements &c.—Mammifères Tertiaires,' p. 68) in uniting *Lophiotherium* and *Propalæotherium* with *Pachynolophus*.

[3] Comptes Rendus, vol. xxix. p. 383 (1849).

[4] Ostéographie, Genus *Palæotherium*, pl. viii. (1846); *Palæotherium*.

[5] *Loc. cit.*

[6] Zool. et Pal. Françaises, 2nd ed. p. 115 (1859).

M. 2431. Fragment of a right maxilla, with m. 3; from the Middle Eocene of Issel (Aude), France. This tooth is rather larger than the specimen figured by Gaudry in 'Les Enchaînements, &c.—Mammifères Tertiaires,' p. 69, fig. 79 (reproduced in fig. 4), and provisionally referred to this species, but smaller than that of *P. argentonicus* figured on p. 161 of the same work. *Purchased*, 1885.

Pachynolophus prevosti, P. Gervais[1].

Syn. *Lophiodon prevosti*, Rütimeyer[2].

This species is somewhat smaller than the last, with which it agrees in the general characters of the upper molars.

Hab. Europe.

M. 2430. Fragment of the left maxilla, containing the three true molars (m. 1 broken); from the Middle Eocene of Gentilly, near Paris. The first tooth agrees exactly with the one figured by Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xxxv. fig. 16. The length of the space occupied by the three true molars is about 0,029. *Purchased*, 1885.

Pachynolophus siderolithicus (Pictet[3]).

Syn. *Hyracotherium siderolithicum*, Pictet[4].

This species is still smaller than the last; it is referred by Gaudry to the present genus.

Hab. Switzerland.

M. 2432. Several fragments of maxillæ, showing the true molars; from the Eocene of Mauremont, Switzerland. The length of the space occupied by the three true molars is 0,021 in one specimen. The teeth agree precisely with the one molar figured by Gaudry in 'Les Enchaînements, &c.—Mammifères Tertiaires,' p. 161, fig. 214. It appears very difficult to distinguish *Anchitherium siderolithicum*, Rütimeyer[5], from the present form. *Purchased*, 1885.

[1] Zool. et Pal. Françaises, 1st ed. vol. ii. Exp. No. 35 (1848–52).

[2] Denkschr. schw. Ges. Nat. vol. xix. art. 3, p. 54 (1862).

[3] Paléontologie Suisse—ser. i. Vertébrés de la Faune Eocène,' p. 175 (1869); *Hyracotherium*.

[4] *Loc. cit.*

[5] Denkschr. schw. Ges. Nat. vol. xix. art. 3, p. 28, pl. iv. fig. 59 (1862).

M. 2433. Several fragments of the mandible and detached lower molars; from the Eocene of Mauremont. These teeth agree with the one figured by Gaudry, *op. cit.* p. 127, fig. 158. *Purchased*, 1885.

Pachynolophus cervulus (P. Gervais[1]).

Syn. *Lophiotherium cervulum*, P. Gervais[2].

This species is apparently known only by the mandible, which indicates a rather larger species than the last.

Hab. Europe.

43553. Casts of three fragments of the mandible, with the teeth. The originals are from the Upper Eocene of Alais (Gard), France. *Presented by Dr. Kowalevsky*, 1872.

M. 2434. Several specimens of lower molars; from the Eocene of Mauremont, Switzerland. The specimens of $\overline{\text{m. 3}}$ agree precisely with the one figured by Rütimeyer in the Denkschr. schw. Ges. Nat. vol. xix. art. 3, pl. iv. fig. 50. *Purchased*, 1885.

Family PALÆOTHERIIDÆ.

The upper premolars are either simpler, or quite as complex as the true molars; the lower molars are crescentoid, and the third lobe of $\overline{\text{m. 3}}$ may be either well developed or almost wanting; all the cheek-teeth are brachydont, and when cement is present it does not fill the valleys. There are three digits in each foot.

Genus **PALÆOTHERIUM,** Cuvier[3].

Including:—*Plagiolophus*, Pomel[4].
Paloplotherium, Owen[5].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{(3-4)}{(3-4)}$, M. $\frac{3}{3}$. In the typical species the four premolars are present in both jaws, $\underline{\text{pm. 4}}$ is as complex as $\underline{\text{m. 1}}$, and $\underline{\text{pm. 3}}$ as $\underline{\text{pm. 4}}$; but in those species forming the so-called genus *Plagiolophus* (*Paloplotherium*) the hinder lobe of $\underline{\text{pm. 4}}$ is more or less aborted, and $\underline{\text{pm. 3}}$ is much simpler than $\underline{\text{pm. 4}}$. There is, however,

[1] Zool. et Pal. Françaises, 1st ed. vol. i. p. 56 (1848–52), *Lophiotherium*.
[2] *Loc. cit.*
[3] Ann. d. Muséum, vol. iii. p. 289 (1804).
[4] Bull. Soc. Géol. France, sér. 2, vol. iv. p. 586 (1847).
[5] Quart. Journ. Geol. Soc. vol. iv. p. 17 (1848; read 1847).

such a complete transition between the two types in respect of the former character, that the writer follows Flower (Cat. Vert. Anim. Mus. R. Coll. Surg. part ii., Mammalia, p. 390 [1884]) in classing all the species in the type genus. There is a large third lobe to m. 3, but none to mm. 4. The first upper premolar appears normally to have no predecessor; but there is evidence (*infra*, p. 39) that it is occasionally a true *dent de remplacement*.

The genus has not been recorded from North America; it has been stated by Bravard to occur in the Pleistocene of Buenos Ayres, but his specimens have been referred by Burmeister[1] to *Macrauchenia*.

Group A. *The third lower premolar as complex as the fourth, and the hinder lobe of the fourth upper premolar complete; four premolars in both jaws.*

Palæotherium magnum, Cuvier[2].

This is the type species, and is larger than any of the others.
Hab. Europe.

29625. Cast of the right maxilla, showing the canine and the entire cheek-dentition. The original is from the Upper Eocene of Montmartre, near Paris, and is preserved in the Paris Museum of Natural History; it is figured in De Blainville's 'Ostéographie,' Genus *Palæotherium*, pl. v.
Presented by the Paris Museum of Natural History.

29432. Fragment of the right maxilla, containing m. 2 and a portion of m. 1; from Montmartre.
Hastings Collection. Purchased, 1855.

29446. Fragment of the left maxilla, with portions of two molars; from Montmartre.
Hastings Collection. Purchased, 1855.

28234. The right upper cheek-dentition, wanting pm. 1; from the Upper Eocene of Débruge, near Apt (Vaucluse), France.
Bravard Collection. Purchased, 1852.

28234 a. Fragment of the right maxilla, with m. 3; from Débruge.
Bravard Collection. Purchased, 1852.

[1] An. Mus. Buenos Ayres, vol. iii. art. 4, p. 133 (1885).
[2] Ann. d. Muséum, vol. iii. p. 367 (1804).

28234 b. Two fragments of the left maxilla, each with two premolars; from Débruge.
Bravard Collection. *Purchased*, 1852.

28234 c, 29652. Three detached upper true molars; from Débruge.
Bravard Collection. *Purchased*, 1852.

26013, 26812. Two detached upper true molars; from Débruge.
Pomel Collection. *Purchased*, 1851.

26811. Fragment of the left maxilla, with the last three premolars and m. 1; from Débruge.
Pomel Collection. *Purchased*, 1851.

28234 d. Fragment of the right maxilla, with three molars, in a damaged condition; from Vaucluse.
Bravard Collection. *Purchased*, 1852.

28234 e. Two specimens of the first upper premolar; from Vaucluse.
Bravard Collection. *Purchased*, 1852.

36928. The third left upper true molar; from the Upper Eocene of Bembridge, Isle of Wight. *Purchased*, 1861.

36921. Two associated right upper true molars; from Bembridge.
Purchased, 1861.

36925, 36926, 36970. Three specimens of the first upper premolar; from Bembridge. *Purchased*, 1861.

28234 e. Three specimens showing the upper milk-molars; from Débruge. *Bravard Collection.* *Purchased*, 1852.

36922. Two specimens of portions of the palate, showing the milk-molars; from Bembridge. *Purchased*, 1861.

33986. Fragment of the extremity of the cranium, showing the incisors, canines, and premolars; from Montmartre.
Presented by Sir R. I. Murchison, Bart., 1860.

36936. Two canines; from Bembridge. *Purchased*, 1861.

36946. Five incisors; from Bembridge. *Purchased*, 1861.

M. 2482. An incisor; from Montmartre. *Purchased*, 1885.

M. 2480. An incisor; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. *Purchased*, 1885.

28240. The nearly-complete mandible, showing the canines and all the cheek-teeth except $\overline{\text{pm. 1}}$; from Débruge.
Bravard Collection. *Purchased*, 1852.

28234 f. The alveolar border of the left ramus of the mandible, showing all the cheek-teeth except $\overline{\text{pm. 1}}$; from Débruge.
Bravard Collection. *Purchased*, 1852.

32518. Hinder part of the right ramus of the mandible, containing the three true molars; from Débruge.
Bravard Collection. *Purchased*, 1852.

28234 g. Two fragments of the right ramus of the mandible, one showing $\overline{\text{m. 3}}$ and the other $\overline{\text{m. 2}}$ and $\overline{\text{m. 3}}$; from Débruge.
Bravard Collection. *Purchased*, 1852.

28234 h. Numerous lower molars; from Débruge.
Bravard Collection. *Purchased*, 1852.

36929–36934. Numerous lower molars; from the Upper Eocene of Bembridge. *Purchased*, 1861.

36935. The first right lower true molar, together with the associated milk-molars; from Bembridge. *Purchased*, 1861.

29852. A left lower true molar; from the Upper Eocene of Montmartre. *Hastings Collection.* *Purchased*, 1855.

M. 2436. A left lower true molar; from the Upper Eocene of Caylux. *Purchased*, 1885.

28234 i. (*Fig.*) The greater part of the right ramus of the mandible of a young individual, showing the last three milk-molars and the minute alveolus of $\overline{\text{mm. 1}}$; from Débruge. This specimen is described and figured by Huxley in the Geol. Mag. dec. i. vol. viii. p. 153, pl. 6.
Bravard Collection. *Purchased*, 1852.

28234 j. Fragment of the right ramus of the mandible of an immature individual, showing $\overline{\text{mm. 3}}$, $\overline{\text{mm. 4}}$, and $\overline{\text{m. 1}}$; from Débruge. *Bravard Collection.* *Purchased*, 1852.

26816. Part of the left ramus of the mandible of a young individual, showing the last three milk-molars; from Débruge.
Pomel Collection. *Purchased*, 1851.

28234 k. The glenoidal extremity of the left scapula; from Débruge.
Bravard Collection. *Purchased*, 1852

28234 l. The right humerus, imperfect proximally; from Débruge. *Bravard Collection. Purchased*, 1852.

28234 m. Two specimens of the distal half of the right humerus; from Débruge. *Bravard Collection. Purchased*, 1852.

30030. The proximal extremity of the right ulna; from the Upper Eocene of the Isle of Wight. *Hastings Collection. Purchased*, 1855.

30591. The greater part of the left ulna; from Débruge. *Bravard Collection. Purchased*, 1852.

28234 n. Two specimens of the associated radius and ulna, one imperfect distally and the other proximally; from Débruge. *Bravard Collection. Purchased*, 1852.

26818. The proximal extremity of a radius; from Débruge. *Pomel Collection. Purchased*, 1851.

27553–27558. Part of the left carpus and the metacarpus; from Débruge. *Bravard Collection. Purchased*, 1852.

28234 o. The right third metacarpal; from Débruge. *Bravard Collection. Purchased*, 1852.

29743. (*Fig.*) The second phalangeal of the third digit of the right fore foot, provisionally referred to this species; from the Upper Eocene of the Isle of Wight. This specimen is described and figured by Owen in the 'British Fossil Mammals and Birds,' pp. 309, 310, fig. 106, where it is suggested that it may belong to *Lophiodon* or *Coryphodon*; as these genera are mainly of Middle and Lower Eocene age, it is, however, more probable that the specimen belongs to *Palæotherium*. *Hastings Collection. Purchased*, 1855.

26820. Part of the shaft of a femur; from Débruge. *Pomel Collection. Purchased*, 1851.

28234 p. Middle part of the shaft of a femur; from Débruge. *Bravard Collection. Purchased*, 1852.

27547–8. The right calcaneum, astragalus, and cuboid; from Débruge. *Bravard Collection. Purchased*, 1852.

140 (O. C.). Cast of the left calcaneum, astragalus, and navicular. The original is from Montmartre. *No history.*

30073. A right astragalus, perhaps belonging to an immature individual of this species; from Hordwell.
Hastings Collection. *Purchased*, 1855.

28234 q. The left astragalus; from Débruge.
Bravard Collection. *Purchased*, 1852.

M. 2481. The left navicular; from Caylux. *Purchased*, 1885.

28241. The right metatarsus; from Débruge.
Bravard Collection. *Purchased*, 1852.

28234 r. The right third metatarsal; from Débruge.
Bravard Collection. *Purchased*, 1852.

M. 2439. The left third metatarsal; from Caylux.
Purchased, 1885.

M. 2435. Numerous bones of the manus and pes; from the Lower Miocene of Ronzon, near Puy-en-Velay (Haute-Loire), France. These bones agree precisely in size with those from Débruge, but are in a less crushed condition; the Ronzon form was distinguished by Gervais as *P. aniciense*, but it was suggested that it might be only a variety.
Purchased, 1885.

28234 s. Part of the axis vertebra; from Débruge.
Bravard Collection. *Purchased*, 1852.

30034, 46020. Two imperfect specimens of the atlas vertebra, provisionally referred to this species; from the Lower Miocene of Hempstead, Isle of Wight. These bones are too large for *Hyopotamus* or *Diplopus*. The species does not appear to have been hitherto recorded from the Hempstead beds; but from its occurrence at Ronzon it might be expected there. *Hastings Collection.* *Purchased*, 1855.

Palæotherium medium, Cuvier[1].

The skull and teeth of this species were described by Cuvier[2] as being rather larger than those of *P. crassum*[3]: the limb bones, provisionally referred by the same writer to *P. medium*, are long and slender, while those referred to *P. crassum* are short and stout, and

[1] Ann. d. Muséum, vol. iii. p. 289 (1804).

[2] See Blainville's 'Ostéographie,' *Palæotherium*, pls. ii., v.

[3] In pl. xxx. fig. 7 of Gervais's 'Zool. et Pal. Françaises,' 2nd ed., some large teeth are figured as *P. crassum*; on page 108 they are, however, termed (the plate is wrongly referred to as xiii.) *P. indeterminatum*; and it is not improbable that they really belong to a large individual of *P. medium*.

indicate a larger animal than the others. The relative size of the teeth of the two forms indicates, however, that this reference is probably erroneous; and the writer has therefore followed Bravard's MS. Catalogue and provisionally reversed the Cuvierian association. It is sometimes very difficult to distinguish the teeth of the two species, as they are liable to some variation in size. The nasals are shorter than in *P. crassum*.

Hab. Europe.

11811. Cast of the skull. The original was obtained from the Upper Eocene of Montmartre, near Paris, and is in the Paris Museum of Natural History; it is figured in De Blainville's 'Ostéographie,' Genus *Palæotherium*, pl. i. The length of the space occupied by the first six upper cheek-teeth is 0,110.

Mantell Collection. Purchased, 1836.

29509. Fragment of the left maxilla, containing the last five cheek-teeth; from Montmartre.

Hastings Collection. Purchased, 1855.

44879 a. Three associated left upper cheek-teeth, provisionally assigned to this species; from Montmartre.

Presented by B. Bright, Esq., 1873.

29874. The third left upper true molar; from Montmartre.

Hastings Collection. Purchased, 1855.

28235. Part of the right maxilla, containing the last five cheek-teeth; from the Upper Eocene of Débruge, near Apt (Vaucluse), France. The dimensions of the teeth figured by Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xxix. fig. 6 (total length 0,131), agree precisely with those of the present specimen. *Bravard Collection. Purchased*, 1852.

28235 a. Fragment of the left maxilla, with the three true molars; from Débruge. *Bravard Collection. Purchased*, 1852.

28235 b. Several fragments of maxillæ, with some of the cheek-teeth; from Débruge.

Bravard Collection. Purchased, 1852.

29812. The inner half of the third left upper true molar; from the Upper Eocene of the Isle of Wight.

Hastings Collection. Purchased, 1855.

M. 2630. Part of the palate; from the Isle of Wight. The last three premolars are shown; the fourth being of unusually large transverse diameter. *No history.*

27505. A palate, showing the four premolars and m. 1, which belongs either to this or the next species; from Montmartre.
Hastings Collection. *Purchased*, 1855.

29423. Fragment of the left side of the palate, with the last three premolars, probably belonging to this species; from Montmartre. *Hastings Collection.* *Purchased*, 1855.

M. 2631. Fragment of the cranium and mandible, showing the upper and lower true molars of the right side; from Montmartre. *Mantell Collection.* *Purchased*, 1836.

43422. Several specimens of upper and lower true molars; from the Eocene of Neuhausen, near Tuttlingen, Würtemberg.
Presented by Professor Quenstedt, 1872.

40360. The third left upper true molar; from the Upper Eocene Bohnerz of Frohnstetten, Würtemberg. *Purchased*, 1867.

36966. Two specimens of upper true molars; from Neuhausen.
Purchased, 1861.

M. 1736. Fragment of the left maxilla, with m. 2 and m. 3; from the Upper Eocene of Bach, near Lalbenque (Lot), France.
Purchased, 1884.

M. 2633. Two upper true molars; from the Upper Eocene of Frohnstetten. *Presented by J. E. Lee, Esq.*, 1885.

M. 2634. Portion of an upper and a lower molar, probably belonging to this species; from the Upper Eocene of Binstead, Isle of Wight. *Presented by J. E. Lee, Esq.*, 1885.

29732. Fragment of the left ramus of a mandible, with two cheek-teeth, provisionally referred to this species; from Hordwell.
Hastings Collection. *Purchased*, 1855.

28235 c. The hinder part of the right ramus of the mandible, with the last four cheek-teeth; from Débruge.
Bravard Collection. *Purchased*, 1852.

36933. Fragment of the mandible, with one molar; from the Upper Eocene of Bembridge, Isle of Wight. *Purchased*, 1861.

36938. Fragment of the left ramus of the mandible of an immature individual, showing nm. 4, pm. 4 (*in alveolo*), m. 1, and m. 2; from Bembridge. *Purchased*, 1861.

28235 d. The symphysis and part of the right ramus of the mandible of an immature individual; from Débruge. The first and second true molars are protruded, but the hinder premolars are *in alveolo*.

Bravard Collection. Purchased, 1852.

28235 e. Fragment of the left ramus of the mandible, with $\overline{\text{m. 2}}$ and $\overline{\text{m. 3}}$; from Débruge.

Bravard Collection. Purchased, 1852.

M. 1734. Part of the right ramus of the mandible, containing the last five cheek-teeth; from Bach. *Purchased*, 1884

The reference of some of the following specimens is provisional.

25221, 36781. Two specimens of the scapula, which may have belonged to large individuals of the present species; from the Upper Eocene Headon beds of Hordwell, Hampshire. These specimens are larger than the scapulæ figured in De Blainville's 'Ostéographie,' Genus *Palæotherium*, under the names of *P. crassum* and *P. medium*, but agree in general contour; they are considerably smaller than the scapula of *P. magnum*. *Presented respectively by S. V. Wood, Esq.*, 1850, *and S. Laing, Esq.*, 1862.

30061. The glenoidal extremity of the left scapula; from Hordwell.

Hastings Collection. Purchased, 1855.

29744. The associated bones of the right fore limb, wanting the scapula and phalangeals; from Hordwell. This specimen agrees well in relative size with No. 36781; the radius and the third metacarpal are slightly larger than Nos. 147 and 11896, but agree in their general contour and proportions; the specimen might have belonged to an individual equal in size to that to which the upper dentition figured in plate xxx. fig. 7 of Gervais's 'Zool. et Pal. Françaises,' 2nd ed., pertained (*vide suprà*, p. 20, note 2).

Hastings Collection. Purchased, 1855.

25247 a. The left humerus, imperfect proximally; from Hordwell. This specimen agrees very closely with the corresponding bone in No. 29744.

Presented by S. V. Wood, Esq., 1850.

147 (O. C.). Cast of the left radius. The original is from Montmartre, and is figured in De Bainville's 'Ostéographie,' Genus *Palæotherium*, pl. iii. (as *P. crassum*).

Mantell Collection. Purchased, 1836.

29628. Cast of the right radius and the associated bones of the manus. The original is from Montmartre, and is preserved in the Paris Museum of Natural History; it is figured by Cuvier in the 'Ossemens Fossiles,' 2nd ed. vol. iii. pl. lviii. fig. 1 (as *P. crassum*). The bones are of considerably smaller size than those of No. 29744, but this difference may be merely individual or racial.

Presented by the Paris Museum of Natural History.

11896. Cast of the right third metacarpal. The original is from Montmartre, and is figured by Cuvier in the 'Ossemens Fossiles,' 2nd ed. vol. iii. pl. xxii. fig. 6, and in De Blainville's 'Ostéographie,' Genus *Palæotherium*, pl. iii. (as *P. crassum*). *Mantell Collection. Purchased.*

29742. The left third metacarpal; from Hordwell. This specimen agrees very closely with the corresponding bone of No. 29744. *Hastings Collection. Purchased*, 1855.

30068. The proximal half of the right second metacarpal; from Hordwell. This specimen is somewhat larger than the corresponding bone in No. 29744.

Hastings Collection. Purchased, 1855.

27561. The right metacarpus of a small individual; from Débruge.

Bravard Collection. Purchased, 1852.

29720. The right metacarpus of a small individual; from Hordwell.

Hastings Collection. Purchased, 1857.

M. 2632. The distal two thirds of the right femur; probably from the Upper Eocene of the Isle of Wight. This specimen agrees very closely with the one figured in De Blainville's 'Ostéographie,' Genus *Palæotherium*, pl. iv. (as *P. crassum*). *No history.*

29746. The right tibia and fibula; from Hordwell. These specimens agree well in relative size with No. 29744.

Hastings Collection. Purchased, 1855.

36782. The proximal extremity of the left tibia; from Hordwell.

Presented by S. Laing, Esq., 1862.

11817. Cast of the bones of the left hind foot. The original is from Montmartre, and is figured (reversed) by De Blainville (*op. cit.*) as *P. crassum*.

Mantell Collection. Purchased, 1836.

28235 f. A calcaneum and three astragali; from Débruge.
Bravard Collection. Purchased, 1852.

30073. A right astragalus, provisionally referred to a large individual of the present species; from Hordwell.
Hastings Collection. Purchased, 1855.

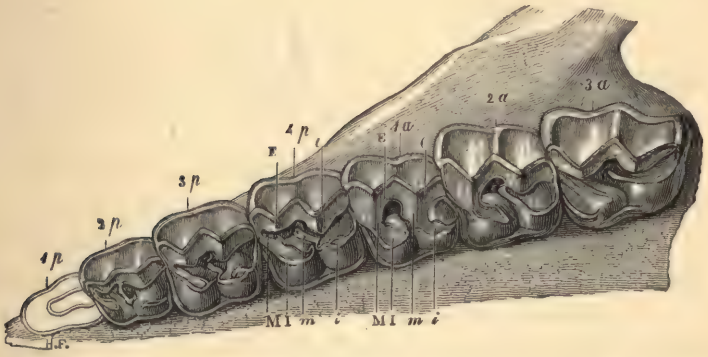
30143, 30110. A second and third lateral phalangeal; from Hordwell. *Hastings Collection. Purchased*, 1855.

Palæotherium crassum, Cuvier[1].

Syn. *Palæotherium velaunum*, Blainville[2].
Palæotherium gervaisi, Aymard[3].

The synonymy is given on the authority of Filhol (Ann. Sci. Géol. vol. xii. art. 3, pp. 68, 69). The teeth (woodcut, fig. 5) are smaller

Fig. 5.



Palæotherium crassum.—The left maxilla and cheek-dentition; from the Upper Eocene gypsum of Montmartre. ⅔. Letters as in fig. 1, p. 4. (From Gaudry's 'Enchaînements.')

than those of *P. medium*, and the limb-bones provisionally associated more slender (*vide suprà*, p. 20).

Hab. Europe.

11810. Cast of the cranium. The original is from the Upper Eocene of Montmartre, near Paris, and is preserved in the Paris Museum of Natural History. It is described and

[1] Ann. d. Muséum, vol. vi. p. 348 (1805).
[2] Ostéographie, Genus *Palæotherium*, pl. ii. (1846).
[3] In Pictet's 'Paléontologie,' 2nd ed. vol. i. p. 311 (1853).

figured by Cuvier in the 'Ossemens Fossiles,' 2nd ed. vol. iii. p. 33, pls. liii. & liv. The length of the space occupied by the first six cheek-teeth is 0,100.

Mantell Collection. Purchased, 1836.

29421. The cranium and the right ramus of the mandible, in a much damaged condition; from Montmartre. A considerable number of the lower teeth are shown.

Hastings Collection. Purchased, 1855.

148 (O. C.). The anterior portion of the palate, showing the outer incisors and portions of the premolars; from Montmartre.

Presented by Baron Cuvier.

28236. The palate and part of the occiput; from the Upper Eocene of Débruge, near Apt (Vaucluse).

Bravard Collection. Purchased, 1852.

27351. Part of the right maxilla, with all the cheek-teeth except pm. 1; from Débruge.

Pomel Collection. Purchased, 1851.

28236 a. Part of the right maxilla, showing all the cheek-teeth; from Débruge. The length of the space occupied by the seven teeth is 0,121.

Bravard Collection. Purchased, 1852.

28236 b. Part of the right maxilla, with the last five cheek-teeth; from Débruge. *Bravard Collection. Purchased*, 1852.

27352. Part of the right maxilla, with all the cheek-teeth; from Débruge. *Pomel Collection. Purchased*, 1851.

28236 c. Part of the right maxilla, with the last five cheek-teeth; from Débruge. *Bravard Collection. Purchased*, 1852.

28236 d. Three fragments of maxillæ, with the hinder cheek-teeth; from Débruge. *Bravard Collection. Purchased*, 1852.

28237. Three fragments of maxillæ, with teeth; from Débruge. These and the next specimen were referred by Bravard to *P. curtum*; but the writer fails to see how they can be distinguished from the preceding specimens. They are larger than the specimen of *P. curtum* figured by Filhol in the Ann. Sci. Géol. vol. viii. pl. xx. fig. 345.

Bravard Collection. Purchased, 1852.

29653. Fragment of the left maxilla, with the last three premolars; from Débruge. *Bravard Collection. Purchased*, 1852.

25227. Fragment of the left maxilla with the three true molars; from the Upper Eocene Headon beds of Hordwell, Hampshire. The dimensions of the teeth agree very closely with those of No. 27352.

Presented by S. V. Wood, Esq., 1850.

M. 2636. The second right upper true molar; from the Upper Eocene of Headon Hill, Isle of Wight.

Presented by B. D'Urban, Esq.

28905. Several upper molars; from the Upper Eocene of the Isle of Wight. *Presented by F. E. Edwards, Esq.*, 1863.

36937. Three associated left upper molars; from the Upper Eocene of Bembridge, Isle of Wight. *Purchased*, 1861.

40359. Four upper molars and five canines; from the Eocene of Frohnstetten, Würtemberg. *Purchased*, 1867.

27357. Fragment of the right maxilla of a young individual, with the four milk-molars; from Débruge. As the first premolar is precisely similar to the first tooth in No. 28236, it may be inferred that this tooth had no predecessor.

Pomel Collection. Purchased, 1851.

28237 a. Fragment of the left maxilla of a young individual, with the four milk-molars in a well-worn condition; from Débruge. *Bravard Collection. Purchased*, 1852.

M. 1733. Fragment of the middle portion of the right half of the cranium, showing the last four cheek-teeth in a much-worn condition; from the Upper Eocene phosphorites of Bach near Lalbenque (Lot), France.

Purchased, 1884.

M. 1735. Fragment of the left maxilla, showing m. 2 and m. 3; from the Upper Eocene phosphorites of Caylux (Tarn-et-Garonne). *Purchased*, 1884.

M. 1739. Fragment of the left maxilla, with the three true molars; from Caylux. *Purchased*, 1884.

11812. Cast of the symphysis and left ramus of the mandible, together with the associated m. 3. The original is from Montmartre, and is preserved in the Paris Museum of Natural History; it is figured by Cuvier in the 'Ossemens Fossiles,' 2nd ed. vol. iii. pl. liii. fig. 1. The length of

the space occupied by the seven cheek-teeth is 0,132, and that by the last six teeth 0,122.

Mantell Collection. Purchased, 1836.

12 (O. C.). The nearly complete mandible, probably belonging to a female of this species; from Montmartre. The length of the space occupied by the last six cheek-teeth is 0,115.

Presented by Baron Cuvier.

29422. Part of the left ramus of the mandible, showing all the cheek-teeth except $\overline{\text{pm. 1}}$ ($\overline{\text{m. 2}}$ and $\overline{\text{m. 3}}$ imperfect); from Montmartre. *Hastings Collection. Purchased*, 1855.

29584. Part of the left ramus of the mandible, showing all the teeth except $\overline{\text{pm. 1}}$; from Montmartre. The impression of the teeth of the upper jaw is shown in the same block.

Hastings Collection. Purchased, 1855.

M. 2639. The greater part of the mandible of a young individual provisionally referred to this species; from Montmartre. The specimen shows the last three milk-molars and $\overline{\text{m. 1}}$.

Mantell Collection. Purchased, 1836.

28236 e. The greater part of the left ramus of the mandible, with all the cheek-teeth except $\overline{\text{pm. 1}}$; from Débruge. This specimen agrees exactly with No. 11812.

Bravard Collection. Purchased, 1852.

28236 f. Part of the left ramus of the mandible, with all the cheek-teeth except $\overline{\text{pm. 1}}$; from Débruge.

Bravard Collection. Purchased, 1852.

27364, 27365. Two portions of mandibular rami, with the hinder cheek-teeth; from Débruge.

Bravard Collection. Purchased, 1852.

28236 g. Part of the right ramus of the mandible, with the last four cheek-teeth; from Débruge.

Bravard Collection. Purchased, 1852.

28236 h. Part of the left ramus of the mandible of an immature individual; from Débruge. The third and fourth premolars are only partially protruded.

Bravard Collection. Purchased, 1852.

28237 b. Two portions of mandibles provisionally referred to females of the present species; from Débruge. In the larger spe-

cimen the space occupied by the last four cheek-teeth is very nearly the same as in No. 11812; but the interval between the canine and the hinder border of $\overline{\text{m.3}}$ is only 0,137, as against 0,141.

Bravard Collection. *Purchased*, 1852.

27371, 28236 i. Three specimens of mandibular rami of young individuals, showing the last three milk-molars and $\overline{\text{m.1}}$; from Débruge. *Bravard Collection.* *Purchased*, 1852.

The reference of some of the following specimens is provisional.

30008. The glenoidal extremity of the right scapula; from Hordwell. *Hastings Collection.* *Purchased*, 1855.

30167. The distal two thirds of the right humerus; from Hordwell. *Hastings Collection.* *Purchased*, 1855.

152 (O. C.). Cast of the left radius. The original is from Montmartre, and is preserved in the Paris Museum of Natural History; it is figured by De Blainville in his 'Ostéographie,' Genus *Palæotherium*, pl. iii. (as *P. medium*).

Presented by Baron Cuvier.

29577. The proximal halves of the associated right radius and ulna; from Montmartre. *Hastings Collection.* *Purchased*, 1855.

36790. The right radius, imperfect distally; from Hordwell. *Presented by S. Laing, Esq.*, 1862.

28236 j. The right radius and ulna, imperfect distally; from Débruge. *Bravard Collection.* *Purchased*, 1852.

28236, 27377. A left radius and ulna, provisionally referred to this species; from Débruge. *Bravard Collection.* *Purchased*, 1852.

28236 k. The right radius; from Débruge. *Bravard Collection.* *Purchased*, 1852.

M. 2443. A right radius (imperfect proximally), provisionally referred to this species; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. *Purchased*, 1885.

11894. Cast of the right third metacarpal. The original is from Montmartre, and is preserved in the Paris Museum of Natural History; it is figured in Cuvier's 'Ossemens Fossiles,' 2nd ed. vol. iii. pl. xx. fig. 3, and in De Blainville's

'Ostéographie,' Genus *Palæotherium*, pl. iii. (as *P. medium*). The length of this specimen is 0,133.
Mantell Collection. Purchased, 1836.

M. 2444. The right third metacarpal; from Caylux. The specimen agrees precisely with the last. *Purchased*, 1885.

27569–27571. The right metacarpus of a small individual; from Débruge. *Bravard Collection. Purchased*, 1852.

M. 2485. The right magnum; from Caylux. *Purchased*, 1885.

M. 2484. The right magnum; from Débruge. *Purchased*, 1885.

28236 m. Two specimens of the distal extremity of the femur; from Débruge. *Bravard Collection. Purchased*, 1852.

153 (O. C.). Cast of the right tibia. The original is from Montmartre, and is preserved in the Paris Museum of Natural History; it is figured in De Blainville's 'Ostéographie,' Genus *Palæotherium*, pl. iv. (as *P. medium*).
Presented by Baron Cuvier.

28236 l. A rather smaller right tibia, provisionally referred to this species; from Débruge.
Bravard Collection. Purchased, 1852.

M. 2445. Distal extremity of a right tibia and fibula, provisionally referred to this species; from Caylux. *Purchased*, 1885.

M. 2637. Cast of the right calcaneum, astragalus, and navicular. The originals are from Montmartre, and are preserved in the Paris Museum of Natural History.
Mantell Collection. Purchased, 1836.

28236 n. Three specimens of the calcaneum and three of the astragalus; from Débruge.
Bravard Collection. Purchased, 1852.

36783. A left astragalus, provisionally referred to this species; from Hordwell. *Presented by S. Laing, Esq.*, 1862.

27562–27568. The bones of the right hind foot, wanting the fourth metatarsal; from Débruge.
Bravard Collection. Purchased, 1852.

18 (O. C.). The proximal extremities of the associated left second and third metatarsals; from Montmartre.
Presented by Baron Cuvier.

Palæotherium latum, Cuvier[1].

This species is founded upon the evidence of metapodial bones, which are of the stout type of those here referred to *P. medium*, but relatively shorter. The upper molars referred to it by De Blainville ('Ostéographie,' Genus *Palæotherium*, pl. v.) are somewhat smaller than those of *P. crassum*.

Hab. Europe.

11956. Cast of the distal half of the left humerus. The original is from the Upper Eocene of Montmartre, near Paris, and is preserved in the Paris Museum of Natural History; it is figured in De Blainville's 'Ostéographie,' Genus *Palæotherium*, pl. iii., and in Cuvier's 'Ossemens Fossiles,' 2nd ed. vol. iii. pl. xxx. figs. 5, 6.

Mantell Collection. Purchased, 1836.

11960. Cast of the left ulna. The original is from Montmartre, and is figured by De Blainville, *loc. cit.*

Mantell Collection. Purchased, 1836.

11895. Cast of the third left metacarpal. The history of this specimen is the same as that of the last; its length is 0,089. It is figured by Cuvier, *op. cit.* pl. lix. fig. 2.

Mantell Collection. Purchased, 1836.

M. 2447. The third left metacarpal, imperfect distally; from the Upper Eocene phosphorites of Caylux (Tarn-et-Garonne), France. *Purchased*, 1885.

The following specimen may perhaps belong to this species.

M. 1769. Part of the right ramus of the mandible of a small *Palæotherium* belonging to the present group; from the Upper Eocene of Bach, near Lalbenque (Lot), France. This specimen contains the four premolars (so determined by the fourth tooth being less worn than the third), the length of the space occupied by which is 0,045. It is somewhat smaller than the corresponding portion of the jaw of *P. crassum*, and somewhat larger than the one figured by Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xvi. figs. 2, 3, as that of *P. curtum* (the plate is lettered *P. minus*). *Purchased*, 1884.

[1] Ossemens Fossiles, 2nd ed. vol. iii. p. 68 (1822).

Palæotherium curtum, Cuvier[1].

Syn. *Palæotherium duvali*, Pomel[2].

This species was originally described as being rather more than one third smaller than *P. medium*. In the skull figured in De Blainville's 'Ostéographie,' genus *Palæotherium*, pl. i., and in the mandible figured by Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xvi. figs. 3, 3 *a* under this name (the plate is lettered *P. minus*), pm. 4 and pm. 3 are as complex as the succeeding teeth. The former feature is shown in a right maxilla figured by Filhol in the Ann. Sci. Géol. vol. viii. art. 1, pl. xx. fig. 345 as belonging to the present species; in this specimen the length of the space occupied by the seven teeth is 0,096. In a mandibular ramus figured under this name by the same writer (*op. cit.* pl. xv. figs. 300, 301) pm. 3 is less complex than pm. 4, and pm. 1 is absent; and the specimen seems more like the mandible of *P. annectans*. The diastema is short.

Hab. Europe.

M. 1392. Fragment of a right maxilla, containing the last three premolars, provisionally referred to this species; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen agrees precisely with the one figured by Filhol in the Ann. Sci. Géol. vol. viii. art. 1, pl. xx. fig. 345.
Purchased, 1884.

11848. Cast of the right third metatarsal. The original is from the Upper Eocene of Montmartre, and is figured in Cuvier's 'Ossemens Fossiles,' 2nd ed. vol. iii. pl. xlii. fig. 6, and in De Blainville's 'Ostéographie,' genus *Palæotherium*, pl. iv. Its length is 0,0655.
Mantell Collection. Purchased, 1836.

28237. The proximal extremity of an ulna and a lateral metapodial, provisionally referred to this species; from the Upper Eocene of Débruge, near Apt (Vaucluse), France.
Bravard Collection. Purchased, 1852.

[1] Ossemens Fossiles, 2nd ed. vol. iii. p. 68 (1822).
[2] Catalogue Méthodique, p. 81 (1853).

Group B. *In this group* pm. 3 *is less complex than* pm. 4, *and the hinder lobe of* pm. 4 *is more or less aborted; the first lower premolar is absent, and* pm. 1 *may be also wanting.*

Palæotherium javali (Filhol[1]).

Syn. *Paloplotherium javali*, Filhol[2].

This species is of slightly smaller size than *P. crassum*; its distinctive characters being the elongated crowns and tall cusps of the upper true molars, the presence of a large quantity of cement in the hollows of all the cheek-teeth, the approximation of the upper canine to the premolars and its apparent separation from the incisors. In these respects the species approaches *Anchitherium*.

Hab. Europe.

M. 2440. Two fragments of the maxillæ of opposite sides; from the Upper-Eocene phosphorites of Caylux (Tarn-et-Garonne), France. One specimen shows m. 2 and m. 3 in a slightly worn condition, and agrees precisely with the maxilla figured by Filhol in the Ann. Sci. Géol. vol. viii. art. 1, pl. xx. fig. 344; the other shows m. 2 and a part of m. 1 in a more worn condition. *Purchased*, 1885.

M. 1738. Part of the left maxilla, containing pm. 4, m. 1, and m. 2; from the Upper-Eocene phosphorites of Bach, near Lalbenque (Lot), France. The diminished size of the hinder lobe of pm. 4 is well exhibited. *Purchased*, 1884.

M. 1738 a. Part of the right maxilla, showing the three premolars and m. 1; from Bach. *Purchased*, 1884.

M. 2441. The left third metacarpal; from Caylux. The length of this bone is 0,115. *Purchased*, 1885.

M. 2446. The left third metatarsal; from Caylux. The length of this specimen is 0,124, and it agrees very closely with the one described by Filhol in the Ann. Sci. Géol. vol. viii. art. 1, p. 167. *Purchased*, 1885.

M. 442. A left astragalus, provisionally referred to this species; from Caylux. *Purchased*, 1885.

[1] Bull. Soc. Philom. Paris, sér. 6, vol. xi. p. 17 (1874), *Paloplotherium*.
[2] *Loc. cit.*

Palæotherium annectans (Owen)[1].

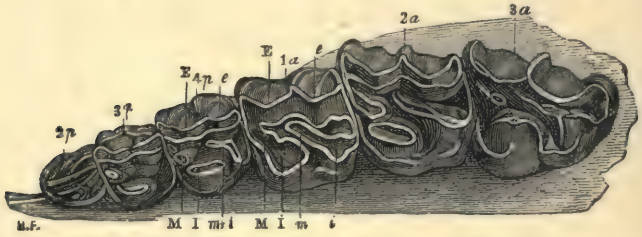
Syn. *Paloplotherium annectans*, Owen[2].
Plagiolophus annectans, Pomel[3].

In this species the upper true molars (woodcut, fig. 6) are nearly equal in size to those of *P. curtum*; the fourth upper premolar has its hinder lobe aborted, and the first premolars are absent, in the adult at least. Cement is present in the true molars, and the upper diastema is of moderate length.

Hab. Europe.

29729. The greater part of the cranium, showing the six cheek-teeth and the alveoli of the incisors and canines of both sides; from the Upper-Eocene Headon beds of Hordwell, Hampshire. This specimen (woodcut, fig. 6) is the type, (*Fig.*)

Fig. 6.



Palæotherium annectans.—The left maxilla and cheek-dentition; from the Upper Eocene of Hordwell, Hampshire. Letters as in fig. 1, p. 4. ½. (From Gaudry's 'Enchaînements.')

and is described and figured by Owen in the Quart. Journ. Geol. Soc. vol. iv. p. 28, pl. iii. figs. 1, 2.

Hastings Collection. Purchased, 1855.

29710, 29735, 30204. Several fragments of maxillæ with cheek-teeth; from Hordwell.

Hastings Collection. Purchased, 1855.

M. 2640. Three upper cheek-teeth; from the Upper Eocene of the Isle of Wight. *Presented by F. E. Edwards, Esq.*, 1863.

[1] Quart. Journ. Geol. Soc. vol. iv. p. 28 (1848), *Paloplotherium*.
[2] *Loc. cit.*
Catalogue Méthodique, p. 83 (1853).

28229. Seven fragments of maxillæ, with cheek-teeth; from the Upper Eocene of Débruge, near Apt (Vaucluse), France.
Bravard Collection. *Purchased*, 1852.

M. 1745. Fragment of the right maxilla, containing the last two premolars and the first two true molars; from the Upper Eocene phosphorites of Bach, near Lalbenque (Lot), France.
Purchased, 1884.

M. 1740 b. Fragment of the left maxilla, showing pm. 4, m. 1, and m. 2; from Bach. *Purchased*, 1884.

M. 1773. Fragment of the left maxilla, showing m. 1 and m. 2 in a half-worn condition; from Bach. *Purchased*, 1884.

M. 2641. Three upper cheek-teeth; from the Upper Eocene of Frohnstetten, Würtemberg.
Presented by J. E. Lee, Esq., 1885.

M. 2642. An upper premolar and true molar (imperfect); from the Upper Eocene of Binstead, Isle of Wight.
Presented by J. E. Lee, Esq., 1885.

29705–08. Four mandibular rami; from Hordwell. One specimen (29705) shows the symphysis, the canines, and the six cheek-teeth, the length of the space occupied by the latter being 0,082.
Hastings Collection. *Purchased*, 1855.

29730. The nearly complete mandible of a subadult individual, showing the canines and the six cheek-teeth of either side; from Hordwell.
Hastings Collection. *Purchased*, 1855.

29709. The hinder part of the left ramus of the mandible of a young individual, showing the three milk-molars and m. 1 *in alveolo*; from Hordwell.
Hastings Collection. *Purchased*, 1855.

27339. The greater part of the mandible, showing the last five cheek-teeth on the left side; from Débruge.
Pomel Collection. *Purchased*, 1851.

28229 a. Two portions of the left ramus of the mandible, the more complete one showing the six cheek-teeth; from Débruge.
Bravard Collection. *Purchased*, 1852.

28229 b. Two specimens, showing the symphysis and parts of the mandibular rami of opposite sides; from Débruge. The more perfect specimen shows the last five cheek-teeth.
Bravard Collection. Purchased, 1852.

M. 1510. The symphysis and left ramus of the mandible, showing the last five cheek-teeth; from Débruge.
Purchased, 1884.

M. 2478. Fragment of the left ramus of the mandible, showing the four middle cheek-teeth; from Débruge.
Purchased, 1885.

M. 2642. A lower cheek-tooth; from the Upper Eocene of Binstead.
Presented by J. E. Lee, Esq., 1885.

M. 2644. Fragment of the right ramus of the mandible, with $\overline{\text{pm. 2}}$ and $\overline{\text{pm. 3}}$; from Binstead.
Presented by J. E. Lee, Esq., 1885.

The reference of the following specimens is provisional, and they may belong to more than one species; the foot-bones are of a rather stouter type than those referred to P. minus.

30009. Glenoidal extremity of the right scapula; from Hordwell.
Hastings Collection. Purchased, 1855.

29988. Distal half of the right radius; from Hordwell.
Hastings Collection. Purchased, 1855.

29725. The left metacarpus of a small individual; from Hordwell. The length of the third metacarpal is 0,091 and its proximal width 0,012. *Hastings Collection. Purchased*, 1852.

28230 a. The right metacarpus of a rather larger individual; from Débruge. The distal extremity of the third metacarpal has been restored.
Bravard Collection. Purchased, 1852.

28243 a. The left third metacarpal; from Débruge. The length of this specimen is 0,089, and its proximal width 0,014.
Purchased, 1885.

28243. The left carpus and metacarpus of a still larger individual; from Débruge. The length of the third metacarpal is 0,095, and its proximal width 0,017.
Bravard Collection. Purchased, 1852.

M. 1482. The right third metacarpal; from the Upper Eocene of Caylux. *Purchased*, 1884.

29719. The left innominate; from Hordwell.
Hastings Collection. Purchased, 1855.

M. 1472. The left innominate; from the Upper Eocene of Caylux. This specimen differs slightly from No. 29719, and may belong to the same form as No. M. 1750.
Purchased, 1884.

30103. The right femur, imperfect distally; from Hordwell.
Hastings Collection. Purchased, 1855.

25257, 30134. Two specimens of the shaft of the left femur; from Hordwell. *Hastings Collection. Purchased*, 1855.

28242. Two specimens of the hind foot; from Débruge. In the larger of the two the length of the third metatarsal is 0,080, and its proximal width 0,016.
Bravard Collection. Purchased, 1852.

M. 1481. The left third metatarsal; from the Upper Eocene of Caylux. This specimen is of large size, and may belong to the same form as No. M. 1750.
Purchased, 1884.

M. 2488. Various carpals, tarsals, and phalangeals, some of which may belong to the present species; from Caylux.
Purchased, 1885.

The following specimen agrees in size with the larger specimens of the corresponding bones noticed above, but is of a different structure; it may belong to one of the allied genera.

M. 2486. A left third metacarpal, wanting the distal epiphysis; from Caylux. *Purchased*, 1885.

The following are larger than typical specimens of P. annectans, *but indicate closely allied forms which may be specifically distinct.*

M. 1750. Two fragments of the same mandible, one showing the canine and the six cheek-teeth, and the other $\overline{\text{m. 2}}$ and $\overline{\text{m. 3}}$; from the Upper-Eocene phosphorites of Mouillac (Tarn-et-Garonne), France. The length of the space

occupied by the series of cheek-teeth is 0,096, and that of the diastema 0,028. The specimens are considerably smaller than the mandible of *P. javali* figured by Filhol in the Ann. Sci. Géol. vol. viii. art. 1, pl. xvii. figs. 308–310. *Purchased*, 1884.

M. 1749. Two associated mandibular rami, agreeing very closely with the preceding; from the Upper-Eocene phosphorites of Bach, near Lalbenque (Lot), France.
Purchased, 1884.

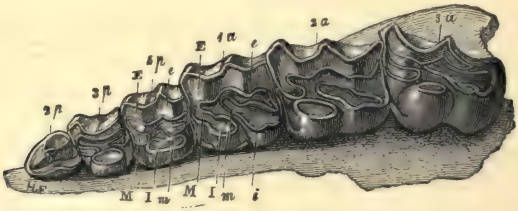
M. 1748. Fragment of a right maxilla, containing m. 1 and m. 2, which agree in relative size with the preceding specimens; from Bach. *Purchased*, 1884.

Palæotherium minus, Cuvier [1].

Syn. *Paloplotherium minus*, P. Gervais [2].
Plagiolophus minor, Pomel [3].
Palæotherium ovinum, Aymard [4].
Plagiolophus ovinus, Pomel [5].

In this species the teeth are rather smaller than in *P. annectans*; but the hinder lobe of pm. 4 is more developed (woodcut, fig. 7).

Fig. 7.



Palæotherium minus.—The left maxilla and cheek-dentition; from the Upper Eocene of Débruge (Vaucluse), France. ½. Letters as in fig. 1, p. 4. (From Gaudry's 'Enchaînements.')

The first upper premolar is present in some instances; pm. 1 appears to be always absent, and pm. 2 is frequently wanting; the upper

[1] Ann. du Muséum, vol. iii. p. 471 (1804).
[2] Zool. et Pal. Françaises, 1st ed. vol. i. p. 63 (1848–52).
[3] Bull. Soc. Géol. France, sér. 2, vol. iv. p. 586 (1847).
[4] Ann. Soc. Agric. Sci. le Puy, vol. xii. p. 246 (1846), *teste* Filhol.
[5] Catalogue Méthodique, p. 82 (1853).

diastema is long. The identity of *P. ovinum* with this species has been determined by Filhol.

Hab. Europe.

28232. Part of the palate, showing the canines and the first three premolars of either side, and the remaining cheek-teeth of the right side; from the Upper Eocene of Débruge, near Apt (Vaucluse), France. This specimen is noteworthy as being one of the few with which the writer is acquainted, showing the first tooth of the cheek-series. This tooth is untouched, while pm. 4 is considerably worn, thus indicating that the former was protruded at a later date than is the case in other forms, and did not come into use with the milk-dentition.

Bravard Collection. Purchased, 1852.

28232 a. Part of the left maxilla and premaxilla, showing the canine, the last five cheek-teeth, and the broken base of pm. 2; from Débruge. There is no trace of pm. 1.

Bravard Collection. Purchased, 1852.

28232 b. Numerous fragments of maxillæ; from Débruge.

Bravard Collection. Purchased, 1852.

M. 2465. Part of the right maxilla, showing the six cheek-teeth; from Débruge. There is no trace of pm 1.

Purchased, 1885.

M. 2464. The palate of a young individual, showing the four milk-molars and the first true molar of either side; from Débruge. In this specimen, mm. 1 is as much worn as the two succeeding teeth, and as it differs slightly in form from pm. 1 in No. 28232, it would seem to indicate that the latter tooth is a true "*dent de remplacement.*"

Purchased, 1885.

36941. The crowns of two molars, probably belonging to this species; from the Upper Eocene of Bembridge, Isle of Wight. One specimen is in germ, and the others but slightly worn. *Purchased*, 1861.

M. 1511. The anterior extremity of the cranium, showing the incisors, canines, and the first three cheek-teeth of the left side; from Débruge. Pm. 1 is present.

Purchased, 1884.

M. 1744 a. Part of the right maxilla, with the last four cheek-teeth; from the Upper-Eocene phosphorites of Bach, near Lalbenque (Lot), France. *Purchased*, 1884.

M. 1746. Part of the left maxilla of an immature individual, showing the three true molars, m. 3 being *in alveolo*; from Bach. *Purchased*, 1884.

M. 1743. Fragment of the left maxilla, containing m. 2 and m. 3; from Bach. *Purchased*, 1884.

M. 1741. Fragment of the left maxilla of a young individual, showing mm. 3, mm. 4, and m. 1; from Bach. *Purchased*, 1884.

28231. The nearly complete mandible, showing two incisors, the canines, and the last four cheek-teeth; from Débruge. *Bravard Collection. Purchased*, 1852.

28233. Numerous imperfect specimens of the mandible; from Débruge. In all these specimens there are but five cheek-teeth. *Bravard Collection. Purchased*, 1852.

28232 c. The symphysis and the right ramus of the mandible, showing six cheek-teeth; from Débruge. *Bravard Collection. Purchased*, 1852.

M. 1511. Two portions of the left ramus of the mandible; from Débruge. *Purchased*, 1884.

M. 2466, M. 2467. Two specimens of part of the right ramus of the mandible, each having six cheek-teeth; from Débruge. *Purchased*, 1885.

M. 1511 a. Part of the left ramus of the mandible, showing the last four cheek-teeth; from Débruge. *Purchased*, 1884.

M. 1832 a. Part of the left ramus of the mandible, showing the last four cheek-teeth; from Bach. *Purchased*, 1884.

M. 1770. Part of the right ramus of the mandible, with the last four cheek-teeth; from Bach. *Purchased*, 1884.

M. 1771. Part of the left ramus of the mandible, showing the last two premolars and the first two true molars; from Bach. *Purchased*, 1884.

M. 1772. Fragment of the right ramus of the mandible, showing the three premolars and the first true molar; from Bach. *Purchased*, 1884.

M. 2468. Three specimens of the symphysis of the mandible; from Débruge. *Purchased*, 1885.

28232 d. A slab of lignite, containing two fragments of the cranium, the mandible, astragalus, and the proximal half of the third metatarsal; from Débruge.
Bravard Collection. Purchased, 1852.

28232 e. Four fragments of mandibular rami of immature individuals; from Débruge.
Bravard Collection. Purchased, 1852.

M. 1393. A fragment of the left ramus of a mandible, containing the three true molars, and belonging either to a large individual of the present, or a small one of the preceding species; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. *Purchased*, 1884.

36961–6. Detached lower cheek-teeth, provisionally referred to the present species; from the Upper Eocene of Bembridge, Isle of Wight. *Hastings Collection. Purchased*, 1855.

The following specimens are provisionally referred to this species, but some of them may belong to Anchilophus.

M. 2467. The left radius, imperfect distally: from Débruge.
Purchased, 1885.

M. 2473. The left radius, imperfect proximally; from Caylux.
Purchased, 1885.

28233 a. Bones of the left fore foot; from Débruge. The length of the third metacarpal is 0,091, and its proximal width 0,011. *Bravard Collection. Purchased*, 1852.

M. 2470. Four metacarpals; from Débruge. The length of the third metacarpal is 0,088, and its proximal width 0,011.
Purchased, 1885.

M. 2474. The right third metacarpal; from Caylux. The length of this specimen is 0,086, and its proximal width 0,010; the corresponding dimensions of an homologous bone from the same deposits, described by Filhol in the Ann. Sci. Géol. vol. viii. art. i. p. 171, being 0,079 and 0,010.
Purchased, 1885.

M. 2475. The left femur; from Caylux. The length of this specimen from the head to the condyle is 0,125.
Purchased, 1885.

M 2476. The right tibia, in two portions; from Caylux.
Purchased, 1885.

28233 b. The greater number of the bones of the right hind foot; from Débruge. The length of the third metatarsal is 0,078, and its proximal width 0,013.
Bravard Collection. Purchased, 1852.

M. 2471–2. The right astragalus, and the left third metatarsal; from Débruge. The length of the latter is 0,070, and its proximal width 0,012. *Purchased*, 1885.

M. 2477. Two specimens of the left third metatarsal; from Caylux. The length of the larger specimen is 0,082, and of the smaller 0,076. *Purchased*, 1885.

The following specimen is not specifically determined.

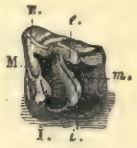
21902. The imperfect right calcaneum; from the Lower Miocene of Ronzon, near Puy-en-Velay (Haute-Loire), France.
Croizet Collection. Purchased, 1848.

Genus **ANCHILOPHUS**, P. Gervais[1].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{?4}{3}$, M. $\frac{3}{3}$.

This genus appears intermediate between *Pachynolophus* and *Anchitherium*. The last upper premolar is as complex as the true

Fig. 8.



Anchilophus radegundensis.—The third left upper true molar; from the Eocene of Lautrec (Tarn). ½. Letters as in fig. 1, p. 4. (From Gaudry's 'Enchaînements.')

molars; there are well-marked median ridges on the outer columns of the upper molars (fig. 8), and the third lower true molar has a large third lobe. The structure of the lower molars presents some resemblance to that of *Pachynolophus*.

[1] Zool. et Pal. Françaises, 1st ed. vol. ii. Expl. no. 35, p. 8 (1848–1852).

Anchilophus radegundensis (P. Gervais[1]).

Syn. *Anchitherium radegundense*, P. Gervais[2].

The upper cheek-teeth (fig. 8) of this small species are characterized by their relatively small antero-posterior diameter.

Hab. Europe.

28238. Fragment of the right maxilla, containing the last four cheek-teeth; from the Upper Eocene of Débruge, near Apt (Vaucluse), France. This specimen is described and figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pp. 85, 86, pl. xxx. fig. 2. (*Fig.*)

Bravard Collection. *Purchased*, 1852.

M. 2424. Fragment of the right maxilla, showing the last five cheek-teeth; from Débruge. The teeth of this specimen are rather larger than those of the last; the third molar agreeing precisely with the one figured by Gaudry in 'Les Enchaînements, &c.—Mammifères Tertiaires,' p. 69, fig. 80 (reproduced in fig. 8), under the present generic name; the length of the space occupied by the three true molars is 0,0274. *Purchased*, 1885.

Anchilophus desmaresti, P. Gervais[3].

This species agrees very closely with the preceding; but the upper true molars are more elongated, and have more prominent ridges on the external surfaces.

Hab. Europe.

M. 2421. Fragment of the left maxilla, containing the three true molars (the third imperfectly protruded); from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen agrees precisely with the one described by Filhol in the Ann. Sci. Géol. vol. viii. art. 1, p. 118; the length of $\underline{\text{m. 2}}$ being 0,0115. *Purchased*, 1885.

M. 1470. The symphysis and part of the left ramus of the mandible; from Caylux. This specimen (woodcut, fig. 9) shows the first two true molars, the last two premolars, and the alveolus of $\underline{\text{pm. 2}}$, there being no trace of $\overline{\text{pm. 1}}$. The diastema is very long, although its full length cannot be determined. (*Fig.*) *Purchased*, 1884.

[1] Zool. et Pal. Françaises, 1st ed. vol. ii. Expl. no. 30, *Anchitherium* (1848–1852).

[2] *Loc. cit.*

[3] *Ibid.* Expl. no. 35, p. 8.

Fig. 9.

Anchilophus desmaresti.—The symphysis and part of the left ramus of the mandible; from the Upper Eocene of Caylux. ½.

M. 1470 a. Two fragments of the mandible, showing the last five cheek-teeth; from Caylux. These specimens agree very closely with one described by Filhol in the Ann. Sci. Géol. vol. viii. art. 1, p. 118[1]; the length of the space occupied by the last four cheek-teeth being 0,044. *Purchased*, 1884.

M. 2422–3. Two fragments of the mandible; from Caylux. *Purchased*, 1885.

36963. Several detached lower true molars; from the Upper Eocene of Bembridge, Isle of Wight. *Purchased*, 1861.

[1] In the ninth line from the top, the word *supérieure* should be read *inférieure*.

Genus **ANCHITHERIUM**, H. v. Meyer[1].

Including *Mesohippus*, Marsh[2].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$. The upper premolars are as complex as the true molars, the external surface of each lobe being without a median ridge; pm. 1 is comparatively small, and the third lobe of m. 3 reduced to a small talon, while there is no infold to the incisors. At least in *A. bairdi* there is a large lachrymal depression.

Anchitherium aurelianense (Blainville[3]).

Syn. *Palæotherium aurelianense*, Blainville[4].
Palæotherium hippoides, Blainville[5].

This is the largest species of the genus, and is elaborately described by Kowalevsky in the Mém. Ac. Nat. Imp. St. Pétersbourg, sér. 7, vol. xx. (1873). There is no trace of the fifth metacarpal; and the meso- and ectocuneiform are separate.

Hab. Europe.

33553. Fragment of the right maxilla, with all the cheek-teeth except pm. 2; from the Middle Miocene of Sansan (Gers), France. *Purchased*, 1858.

21836. Fragment of the right maxilla, with the last three premolars; from Sansan. *Croizet Collection. Purchased*, 1848.

29626. Cast of a portion of the left maxilla, showing the last four cheek-teeth. The original is from Sansan, and is figured in De Blainville's 'Ostéographie,' Genus *Palæotherium*, pl. vii. *Hastings Collection. Purchased*, 1855.

33554–33556. Three fragments of maxillæ, showing cheek-teeth in a much-worn condition; from Sansan. *Purchased*, 1858.

40758. The second right upper premolar; from Sansan. *Presented by C. Falconer, Esq.*, 1867.

21840. Two upper molars; from Sansan. *Croizet Collection. Purchased*, 1848.

M. 2281. Fragment of the right maxilla, containing pm. 2 and pm. 3; from Sansan. *Purchased*, 1885.

[1] Neues Jahrb. 1844, p. 298.
[2] Amer. Journ. ser. 3, vol. ix. p. 248 (1875).
[3] Ostéographie, Genus *Palæotherium*, p. 43 (1846), *Palæotherium*.
[4] *Loc. cit.* [5] *Ibid.*

M. 2413. Fragment of the left maxilla, with pm. 1 and pm. 2; from Sansan. The first tooth is very much more worn than the second. *Purchased*, 1885.

M. 2413 a. A right upper molar; from Sansan. *Purchased*, 1885.

43625. The second left upper premolar; from the Middle Miocene of Georgensgmünd, Würtemberg.
Presented by K. Murchison, Esq., 1872.

33557. Part of the right ramus of the mandible, showing all the cheek-teeth except pm. 1; from Sansan. *Purchased*, 1858.

33558. Part of the right ramus of the mandible, with the last five cheek-teeth; from Sansan. *Purchased*, 1858.

33558 a. The greater part of the left ramus of the mandible, containing all the cheek-teeth (the crown of pm. 1 broken off); from Sansan. *Purchased*, 1858.

33558 b. Part of the left ramus of the mandible, with pm. 2 and pm. 3; from Sansan. *Purchased*, 1858.

33558 c. Fragment of the right ramus and symphysis of the mandible; from Sansan. *Purchased*, 1858.

M. 2411. The greater part of the right ramus of the mandible, showing all the cheek-teeth (the crown of pm. 1 wanting); from Sansan. *Purchased*, 1885.

M. 2412. Fragment of the left ramus of the mandible, containing two cheek-teeth in an unworn condition; from Sansan.
Purchased, 1885.

29627. Cast of part of the right ramus of the mandible, showing the last four cheek-teeth. The original is from Sansan.
Hastings Collection. Purchased, 1855.

48446. Two fragments of the left ramus of the mandible, showing pm. 2, pm. 3, and m. 2; from Georgensgmünd.
Presented by C. Falconer, Esq., 1867.

40757. Three unworn incisors; from Sansan.
Presented by C. Falconer, Esq., 1867.

M. 2284. The glenoidal extremity of the right scapula; from Sansan. *Purchased*, 1885.

M. 2282. The proximal third of the right humerus; from Sansan.
Purchased, 1885.

21843. The distal third of the left humerus; from Sansan.
Croizet Collection. *Purchased*, 1848.

M. 2283. The distal portion of the left humerus; from Sansan.
Purchased, 1885.

M. 2285. The proximal half of the left radius; from Sansan.
Purchased, 1885.

M. 2286. The distal portion of the right radius; from Sansan.
Purchased, 1885.

21841. The distal portion of the left radius; from Sansan.
Croizet Collection. *Purchased*, 1848.

33564, M. 2416–7. Several carpals; from Sansan.
33564, *purchased*, 1852; M. 2416–7, *purchased*, 1885.

M. 2288. Part of the right innominate; from Sansan.
Purchased, 1885.

33559. The left femur; from Sansan. *Purchased*, 1858.

33560. The left tibia; from Sansan. *Purchased*, 1858.

M. 2289. The proximal half of the right tibia; from Sansan.
Purchased, 1885.

M. 2290. The distal half of the right tibia; from Sansan.
Purchased, 1885.

21838. The distal portion of the right tibia; from Sansan.
Croizet Collection. *Purchased*, 1848.

33561. The right calcaneum; from Sansan. *Purchased*, 1858.

33572. The right calcaneum (imperfect); from Sansan.
Purchased, 1858.

21839. The right calcaneum; from Sansan.
Croizet Collection. *Purchased*, 1848.

M. 2292. The left calcaneum; from Sansan. *Purchased*, 1885.

33562. The right astragalus; from Sansan. *Purchased*, 1858.

21837. The left astragalus; from Sansan.
Croizet Collection. *Purchased*, 1848.

33573. The left astragalus; from Sansan. *Purchased*, 1858.

M. 2291. The left astragalus; from Sansan. *Purchased*, 1885.

33563. The right navicular; from Sansan. *Purchased*, 1858.

33574. The left navicular; from Sansan. *Purchased*, 1858.

M. 2294. The proximal half of the third right metatarsal; from Sansan. *Purchased*, 1885.

21846. The proximal extremity of the third right metatarsal; from Sansan. *Croizet Collection.* *Purchased*, 1848.

33575. The proximal portion of the third right metatarsal; from Sansan. *Purchased*, 1858.

33565. The third left metatarsal; from Sansan. *Purchased*, 1858.

M. 2287. The proximal half of the third left metatarsal; from Sansan. *Purchased*, 1885.

M. 2296. The proximal extremity of the fourth right metatarsal; from Sansan. *Purchased*, 1885.

M. 2294. The proximal extremity of the fourth left metatarsal; from Sansan. *Purchased*, 1885.

21845. The distal extremity of a metapodial; from Sansan. *Croizet Collection.* *Purchased*, 1848.

33576. The distal extremity of a metapodial; from Sansan. *Purchased*, 1858.

33569. A lateral metapodial, imperfect distally; from Sansan. *Purchased*, 1858.

M. 2293. The three phalangeals of a third digit; from Sansan. *Purchased*, 1885.

21844. The first phalangeal of a third digit; from Sansan. *Croizet Collection.* *Purchased*, 1848.

33566. The first phalangeal of a third digit; from Sansan. *Purchased*, 1858.

33567. The second phalangeal of a third digit; from Sansan. *Purchased*, 1858.

33568. The terminal phalangeal of a third digit; from Sansan. *Purchased*, 1858.

33570. The first and second phalangeals of a lateral digit; from Sansan. *Purchased*, 1858.

M. 2296. Several lateral phalangeals and imperfect metapodials; from Sansan. *Purchased*, 1885.

M. 2295. The atlas vertebra; from Sansan. *Purchased*, 1885.

Anchitherium bairdi (Leidy [1]).

Syn. *Palæotherium bairdi*, Leidy [2].
Mesohippus bairdi, Marsh [3].

This is a small species, referred to *Anchitherium* by Leidy in the 'Ancient Fauna of Nebraska,' p. 67 (Smithsonian Contributions, vol. vi. [1853]); and made by Marsh the type of the genus *Mesohippus*. The lateral digits are relatively larger than in the last species; the fifth metacarpal is represented by a splint, and the meso- and ectocuneiform are separate.

Hab. N. America.

40957. Cast of the skull. The original is from the Miocene of Dakota, U.S.A., and is described and figured by Leidy in the Journ. Ac. Nat. Sci. Philad. ser. 2, vol. vii. p. 303, pl. xx. (1869). *Purchased*, 1868.

29685. Fragment of a right maxilla, with the three true molars; from Dakota. This specimen is figured in the accompanying woodcut (fig. 10). *Purchased*, 1855.

Fig. 10.

Anchitherium bairdi.—The right upper true molars; from the Miocene of Dakota. ½.

29684. Fragment of the left ramus of the mandible, with two cheek-teeth; from Dakota. *Purchased*, 1855.

Family EQUIDÆ.

The division between this and the preceding family is but an arbitrary one, and *Hipparion*, owing to the usual presence of three digits, is classed by Cope and Flower in the latter. The apparently

[1] Proc. Ac. Nat. Sci. Philad. vol. v. p. 122 (1851; vol. dated 1852); *Palæotherium*.
[2] *Loc. cit.*
[3] Amer. Journ. ser. 3, vol. ix. p. 248 (1875).

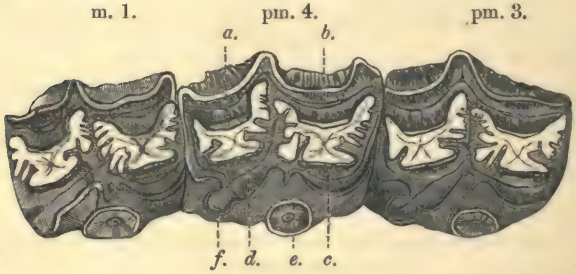
monodactyle character of one species, and the structure of the cranium and dentition is, however, so essentially equine, that it is here placed in the present family. The upper premolars are as complex as the true molars, and all the cheek-teeth are of an extremely hypsodont type, the cement completely filling the valleys; the lower molars are crescentoid, and there is scarcely any distinct third lobe to $\overline{\text{m. 3}}$. The digits are either one or three in number.

Genus **HIPPARION**, Christol [1].

Syn. *Hippotherium*, Kaup [2].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{3}$, M. $\frac{3}{3}$. The first upper cheek-tooth, which appears with the milk-series, and apparently has no predecessor, is usually shed before the animal is adult. The anterior "pillar" [3] in the upper cheek-teeth is disconnected from the anterior inner "crescent" for at least three quarters of its length; and there

Fig. 11.



Hipparion, sp.[4]—Polished section of three right upper cheek-teeth, in a fragment of the maxilla; from the Siwaliks of Perim Island, Gulf of Cambay, India. Indian Museum, Calcutta (no. C. 273). *a*. Posterior, and *b*, anterior outer crescent; *c*, anterior, and *d*, posterior inner crescent; *e*, anterior, and *f*, posterior pillar. (From the 'Palæontologia Indica.') ½.

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[1] Ann. Sci. Indust. Mid. France, vol. i. p. 180 (1832), *teste* Christol.

[2] Neues Jahrb. 1833, p. 327. As a subgenus.

[3] For the definition of the terms employed in the description of the cheek-teeth of the *Equidæ*, see 'Palæontologia Indica' (Mem. Geol. Surv. Ind.), ser. 10, vol. ii. pp. 73, 74, and the accompanying woodcut (fig. 11).

[4] If this form be specifically distinct, it has been proposed that it should be known as *H. feddeni*, Lydekker, 'Palæontologia Indica,' ser. 10, vol. iii. p. 16 (1885).

are three digits in each foot, with the apparent exception of *H. antilopinum*, in which they appear reduced to one.

There are two cavities on the surface of the maxilla, the second of which corresponds to the "larmier" of the ruminant Artiodactyla. The accompanying woodcut (fig. 11) shows the structure of the upper cheek-teeth in an undetermined Indian species. The number of digits apparently varies from one to three.

Hipparion gracile (Kaup[1]).

Syn. *Equus* (*Hippotherium*) *gracilis*, Kaup[2].
Equus (*Hippotherium*) *nanus*, Kaup[3].
Equus primigenius, Meyer[4].
Equus angustidens, Meyer[5].
Hipparion diplostylum, Gervais[6].
Hipparion prostylum, Gervais[7].
Hipparion mesostylum, Gervais[8].
Hipparion mediterraneum, Hensel[9].
Hipparon brachypus, Hensel[10].

According to Gaudry, 'Animaux Fossiles du Mont Léberon,' pp. 32–33, the above-mentioned forms are in all probability specifically the same; although individual specimens of the bones and teeth present a great variation in size. This difference, coupled with the extreme difficulty of distinguishing many of the recent *Equidæ* by their teeth and bones alone (see page 73), suggests, however, the possibility of there being more than one European species of the present genus. H. von Meyer's names have the priority over Kaup's, but the latter is too generally accepted to admit of supersession. This is the type species, and has three digits to each foot.

Hab. Europe, North-western Persia[11], and Algeria[12].

[1] Neues Jahrb. 1833, p. 327; *Equus* (*Hippotherium*).
[2] *Loc. cit.* [3] *Loc. cit.*
[4] Zeitschr. für Min. 1829, vol. i. p. 152.
[5] *Ibid.* p. 280.
[6] Comptes Rendus, vol. xxix. p. 285 (1849).
[7] *Loc. cit.* [8] *Loc. cit.*
[9] Monatsb. k. preuss. Ak. Wiss. 1860, p. 356 (1861).
[10] *Ibid.* 1862, p. 560 (1863).
[11] See a paper by the present writer on Persian Mammals in the Quart. Journ. Geol. Soc. vol. xlii. (1886).
[12] Thomas, Mém. Soc. Géol. France, sér. 3, vol. iii. art. 2, pl. viii. (ii.) (1884).

M. 1883. Cast of the cranium and mandible. The original is from the Lower Pliocene of Pikermi, Attica, and is preserved in the Paris Museum of Natural History; it is figured by Gaudry in the 'Animaux Fossiles et Géologie de l'Attique,' pl. xxxv. fig. 1.

Presented by R. Lydekker, Esq., 1884.

33603. The greater part of the cranium, in a somewhat crushed condition; from the Lower Pliocene of Cucuron (Vaucluse), France. The length of the series of cheek-teeth is somewhat less than in the specimen figured by Gaudry, *op. cit.* pl. xxxiv. fig. 7.

Bravard Collection. Purchased, 1852.

26617. The greater part of the cranium of an immature individual; from Cucuron. This specimen shows the incisors; the length of the series of cheek-teeth is considerably less than in No. 33603. *Pomel Collection. Purchased*, 1851.

49685. The middle portion of the cranium, showing the last five cheek-teeth of the right side; from Pikermi. The teeth agree very closely in size with those of No. 26617.

Purchased, 1879.

49692. Fragment of the right maxilla of an immature individual, provisionally referred to the present species; from Pikermi. This specimen shows the five middle cheek-teeth, whose united length exceeds that of the corresponding teeth in the specimen figured by Gaudry (*op. cit.*).

Purchased, 1879.

49693. Fragment of the left maxilla of a large individual, showing two cheek-teeth; from Pikermi. *Purchased*, 1879.

49694. Part of the left maxilla of a young individual, showing the last three milk-molars; from Pikermi. The plication of the enamel is less complex than in the milk-molars figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pl. xi. fig. 2, under the name of *H. antilopinum*[1], and the hinder "pillar" of mm. 2 differs by being earlier connected with the adjacent "crescent."

Purchased, 1879.

[1] *Vide infrà*, p. 60.

27590. The imperfect right maxillæ of a small individual, showing all the cheek-teeth except pm. 1 on both sides and the left m. 3; from Cucuron. The length of the dental series is nearly the same as in No. 26617.
Bravard Collection. Purchased, 1852.

27585. Part of the left maxilla of an immature individual of large size, showing mm. 3, mm. 4, m. 1, and m. 2; from Cucuron. The milk-molars are elongated.
Bravard Collection. Purchased, 1852.

33691. Part of the left maxilla, showing the five middle cheek-teeth; from Cucuron.
Bravard Collection. Purchased, 1852.

33692. Fragment of the left maxilla, containing four cheek-teeth; from Cucuron. *Bravard Collection. Purchased*, 1852

33599. Fragment of the right maxilla, with mm. 2 and mm. 3; from Cucuron. *Bravard Collection. Purchased*, 1852.

33694. The three associated right upper true molars; from Cucuron.
Bravard Collection. Purchased, 1852.

27592. The associated upper cheek-teeth of both sides, wanting the right m. 3 and pm. 1 of both sides; the premolars and the left m. 3 are in germ; from Cucuron.
Bravard Collection. Purchased, 1852.

19439. Part of the left maxilla of a large individual; from the Upper Miocene of Eppelsheim, Hessen Darmstadt.
Purchased, 1845.

49696. Six detached upper cheek-teeth; from Pikermi.
Purchased, 1879.

21018. Numerous detached upper cheek-teeth; from Eppelsheim.
Purchased from Dr. Kaup, 1847.

27477. Several detached upper cheek-teeth; from Eppelsheim.
Hastings Collection. Purchased, 1855.

27479. An incisor; from Eppelsheim.
Hastings Collection. Purchased, 1855.

M. 421. Several detached cheek-teeth from Eppelsheim.
Enniskillen Collection. Purchased, 1882.

M. 420. An upper and a lower cheek-tooth; from the Upper Miocene of Alzey, Hessen Darmstadt.
Enniskillen Collection. *Purchased*, 1882.

38726. Four upper cheek-teeth, provisionally referred to the present species; from the Lower Pliocene of Concud, near Teruel, Spain. *Purchased*, 1864.

43614. A right upper cheek-tooth, provisionally referred to the present species; from Concud.
Presented by Professor Vilanova y Piera, 1870.

37409, 46696, 48962. Three upper cheek-teeth; from the Red Crag of Suffolk. *Purchased.*

35858. The outer half of an upper cheek-tooth; from the Red Crag of Suffolk. *Presented by J. Berners, Esq.*, 1861.

28247, 37410, 48971. Three lower cheek-teeth; from the Red Crag of Suffolk. *Purchased.*

49695. The extremity of the premaxillæ of an immature individual, showing the three incisors of the right side; from Pikermi.
Purchased, 1879.

3602. The extremity of the premaxillæ of an immature individual, showing the three incisors of either side; from Cucuron.
Bravard Collection. *Purchased*, 1852.

33699. The extremity of the premaxillæ of a very old individual, showing all the incisors, except the third of the right side; from Cucuron.
Bravard Collection. *Purchased*, 1852.

49697. Part of the right ramus of the mandible, with the six cheek-teeth; from Pikermi. *Purchased*, 1879.

49698. Fragment of the right ramus of the mandible, with $\overline{\text{pm. 2}}$ and $\overline{\text{pm. 3}}$; from Pikermi. *Purchased*, 1879.

49699. Fragment of the left ramus of the mandible of a young individual, showing the three milk-molars; from Pikermi.
Purchased, 1879.

49686. Portions of two associated mandibular rami; from the Lower Pliocene of Mont Léberon (Vaucluse), France.
Purchased, 1879.

33711. The right ramus of the mandible of an immature individual, showing the three milk-molars and $\overline{\text{m. 1}}$; from Cucuron.
Bravard Collection. Purchased, 1852.

26618. The right ramus of the mandible of a younger individual; from Cucuron. This specimen shows the canine and the three milk-molars. *Pomel Collection. Purchased*, 1851.

33610. Part of the left ramus of the mandible of a young individual, showing the three milk-molars; from Cucuron.
Bravard Collection. Purchased, 1852.

33611. Part of the left ramus of the mandible of a young individual, showing the three milk-molars; from Cucuron.
Bravard Collection. Purchased, 1852.

27587. Part of the left ramus of the mandible, with the first four cheek-teeth; from Cucuron.
Bravard Collection. Purchased, 1852.

33614. Part of the right ramus of the mandible, with the six cheek-teeth; from Cucuron.
Bravard Collection. Purchased, 1852.

33713. Part of the right ramus of the mandible, showing the last four cheek-teeth; from Cucuron.
Bravard Collection. Purchased, 1852.

33714. The alveolar portion of the left ramus of the mandible, showing the six cheek-teeth; from Cucuron.
Bravard Collection. Purchased, 1852.

33608. Fragment of the right ramus of a mandible, with the first two cheek-teeth; from Cucuron.
Bravard Collection. Purchased, 1852.

33612. The anterior portion of the mandible of a young individual, showing portions of the three milk-molars; from Cucuron.
Bravard Collection. Purchased, 1852.

26619. Fragment of a mandible, showing four cheek-teeth in a very much worn condition; from Cucuron.
Pomel Collection. Purchased, 1851.

M. 248. The greater portion of the left ramus of the mandible, showing the six cheek-teeth; from Eppelsheim.
Enniskillen Collection. Purchased, 1882.

27476. The greater portion of the right ramus of the mandible, showing the six cheek-teeth ; from Eppelsheim.
Hastings Collection. Purchased, 1855.

21012. The symphysis and part of the right ramus of the mandible, showing the second and third incisors, and all the cheek-teeth except $\overline{\text{m. 3}}$; from Eppelsheim.
Purchased from Dr. Kaup, 1847.

21013. Part of the left ramus of the mandible of a young individual, showing the three milk-molars ; from Eppelsheim.
Purchased from Dr. Kaup, 1847.

M. 249. Fragment of the right ramus of the mandible, with $\overline{\text{m. 2}}$ and $\overline{\text{m. 3}}$; from Eppelsheim.
Enniskillen Collection. Purchased, 1882.

21018, 27478. Numerous detached lower cheek-teeth ; from Eppelsheim. *Purchased.*

21024. Cast of the extremity of the mandibular symphysis of an immature individual, showing the three incisors of either side. The original is from Eppelsheim, and is figured by Kaup in the 'Beiträge,' pt. 5, pl. iii. fig. 6.
Purchased.

M. 355. Part of the left ramus of the mandible of a young individual, showing the three milk-molars, and $\overline{\text{m. 1}}$ *in alveolo* ; from Eppelsheim. *Egerton Collection. Purchased*, 1882.

M. 354. Numerous detached cheek-teeth ; from Eppelsheim.
Egerton Collection. Purchased, 1882.

49703. The distal portion of the left humerus ; from Pikermi.
Purchased, 1879.

49704. The distal portion of the right radius, together with the associated scaphoid, lunar, magnum, and part of the third metacarpal ; from Pikermi. *Purchased*, 1879.

44801. The distal half of a left radius, provisionally referred to this species ; from Toledo, Spain (the age is unknown).
Presented by Benjamin Bright, Esq., 1873.

33721. The right radius, wanting the distal epiphysis ; from Cucuron. *Bravard Collection. Purchased*, 1852.

33722. The left radius ; from Cucuron.
Bravard Collection. Purchased, 1852.

M. 1976. Cast of the distal portion of the right fore limb, from the middle of the carpus downwards. The original is from Pikermi, and is preserved in the Paris Museum of Natural History; it is precisely similar to the specimen figured by Gaudry in the 'Animaux Fossiles et Géologie de l'Attique,' pl. xxxv. fig. 14.

Presented by the Paris Museum of Natural History, 1885.

27591. The right metacarpus and phalanges of a smaller form; from Cucuron. *Bravard Collection. Purchased*, 1852.

33731. The right third metacarpal, rather smaller than the corresponding bone of the preceding specimen; from Cucuron. *Bravard Collection. Purchased*, 1852.

33732. The right third metacarpal, agreeing with the last; from Cucuron. *Bravard Collection. Purchased*, 1852.

33732 a. The right third metacarpal (imperfect distally), of a more slender type; from Cucuron. *Bravard Collection. Purchased*, 1852.

M. 1975. Cast of the distal half of the left carpus, together with the complete third, and the proximal portions of the second and fourth metacarpals. The original is from Pikermi, and is preserved in the Paris Museum of Natural History.

Presented by the Paris Museum of Natural History, 1885.

33729. The left third metacarpal; from Cucuron. *Bravard Collection. Purchased*, 1852.

33637. The left third metacarpal; from Cucuron. *Bravard Collection. Purchased*, 1852.

27480. The left third metacarpal; from Eppelsheim. *Hastings Collection. Purchased*, 1855.

49687. Block of matrix containing a considerable portion of the two innominates; from Mont Léberon. *Purchased*, 1879.

49701, 49702. Two portions of the right innominate; from Pikermi. *Purchased*, 1879.

M. 2645. Cast of the right femur of a very large individual. The original is from Eppelsheim. *Purchased.*

33641. The left femur of a small individual; from Cucuron. This specimen is only two thirds the length of the preceding.
Bravard Collection. Purchased, 1852.

33640. The distal portion of the left femur of a large individual; from Cucuron. *Bravard Collection. Purchased*, 1852.

26644. The distal half of the right femur of a smaller individual; from Cucuron. *Pomel Collection. Purchased*, 1851.

33642. The left tibia; from Cucuron.
Bravard Collection. Purchased, 1852.

33745. The left tibia; from Cucuron.
Bravard Collection. Purchased, 1852.

M. 1977. Cast of the distal portion of the right hind limb, from the tarsus downwards. The original is from Pikermi, and is preserved in the Paris Museum of Natural History.
Presented by the Paris Museum of Natural History, 1885.

26625. The left tarsus and metatarsus of a smaller individual; from Cucuron. The fourth metacarpal is considerably larger than the second. *Pomel Collection. Purchased*, 1851.

27589. The right metatarsus; from Cucuron. The fourth metacarpal is much larger than the second. The specimen is noticed by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. xi.
Bravard Collection. Purchased, 1852.

49705. The greater portion of the distal elements of the left hind limb, comprising the distal half of the tibia, astragalus, calcaneum, cuboid, navicular, entocuneiform, third metatarsal, and first and second phalangeals of the same digit; from Pikermi. *Purchased*, 1879.

33640. The distal half of the left tarsus, together with the greater portion of the metatarsus and phalangeals; from Cucuron.
Bravard Collection. Purchased, 1852.

33680. The left third and fourth metatarsals; from Cucuron.
Bravard Collection. Purchased, 1852.

33679. A third metapodial, imperfect proximally; from Cucuron.
Bravard Collection. Purchased, 1852.

49690. The distal extremity of a third metapodial; from Mont Léberon. *Purchased*, 1879.

33650–52. Three specimens of the right calcaneum; from Cucuron. *Bravard Collection. Purchased*, 1852.

33649. The left calcaneum and astragalus; from Cucuron. *Bravard Collection. Purchased*, 1852.

33666, 33666 a, 33746. Three specimens of the right astragalus; from Cucuron. *Bravard Collection. Purchased*, 1852.

49689. The right astragalus; from Mont Léberon. *Purchased*, 1879.

21491. The right astragalus, of very large size; from Eppelsheim. *Purchased from Dr. Kaup*, 1847.

36597. The left astragalus, and a portion of the calcaneum; from Pikermi. This specimen agrees in size with the last. *Presented by P. J. Gran, Esq.*, 1853.

33657. The left astragalus; from Cucuron. *Bravard Collection. Purchased*, 1852.

M. 421 a. A second phalangeal of the third digit; from Eppelsheim. *Enniskillen Collection. Purchased*, 1882.

49700. Part of the centrum of the axis vertebra; from Pikermi. *Purchased*, 1879.

Hipparion antilopinum (Falconer and Cautley [1]).

Syn. *Hippotherium antelopinum*, Falconer and Cautley [2].

The dentition of this species appears almost indistinguishable from that of *H. gracile*, but the limb-bones provisionally referred to it indicate a monodactyle form [3]. A cranium which had been

[1] 'Fauna Antiqua Sivalensis,' pt. 9, pl. lxxxii. (1849), *Hippotherium*.

[2] *Loc. cit.*

[3] These specimens were referred by Falconer and Cautley to this species in the 'Fauna Antiqua Sivalensis;' and Prof. Gaudry, in the 'Animaux Fossiles du Mont Léberon,' p. 40 (1873), noticed that they indicated a monodactyle form. In the 'Palæontologia Indica,' ser. 10, vol. ii. p. 79, the present writer (not having then seen the specimens) doubted the correctness of their specific reference, but an examination of the specimens themselves induces him to think that Falconer and Cautley's view is probably correct.

provisionally referred to it ('Palæontologia Indica,' ser. 10, vol. iii. pp. 11, 14) presents well-marked distinctions from *H. gracile*, but it is not certain that this specimen may not belong to the same form as certain jaws from the Punjab figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pl. xi., under the present name. A specimen (No. M. 2646), noticed below, indicates that these specimens may be specifically distinct, this being confirmed by the Punjab teeth being found in association with the distal articular surfaces of small-sized lateral metapodials, and with first phalangeals of a stouter type than those referred to the present form. If this inference should be correct, the Punjab form may be named *H. punjabiense*.

Hab. India.

M. 2647. (*Fig.*) Part of the right maxilla, showing all the cheek-teeth except pm. 1; from the Pliocene of the Siwalik Hills, India. This specimen is the type, and is figured (reversed) by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. lxxxii. figs. 13, 13*a*; m. 3 is only just touched by wear. *Presented by Dr. Hugh Falconer.*

16170. (*Fig.*) Middle portion of the cranium, showing pm. 4 and the three true molars; from the Siwalik Hills. Figured by Falconer and Cautley, *op. cit.* pl. lxxxii. fig. 16.

Cautley Collection. Presented, 1842.

M. 2646. Part of the maxilla of a young individual, showing the three milk-molars and m. 1; from the Siwalik Hills. The first true molar is well worn; the milk-molars agree nearly in length with those of the younger specimen from the Punjab figured under the name of *H. antilopinum* in the 'Palæontologia Indica,' ser. 10, vol. ii. pl. xi. fig. 2, but are relatively narrower, as is shown by the following measurements:—

	No. M. 2646.	Punjab jaw.
Length of mm. 3	0,024	0,025
Width „ „	0,020	0,024
Length of mm. 4	0,025	0,026
Width „ „	0,020	0,0242

This difference, as already observed, not improbably indicates specific distinction.

Presented by Dr. Hugh Falconer

40825. Part of the left maxilla of an immature individual, provisionally referred to the present species; from the Siwaliks of Perim Island, Gulf of Cambay. This specimen shows two premolars *in alveolo*, m. 1 (with the crown cut and polished), m. 2 just protruded, and m. 3 *in alveolo*.
Presented by C. Falconer, Esq., 1867.

M. 2648. (*Fig.*) Fragment of an upper cheek-tooth; from the Siwalik Hills. Figured by Falconer and Cautley, *op. cit.* pl. lxxxii. fig. 17. *Cautley Collection. Presented*, 1842.

16580. Two upper cheek-teeth, provisionally referred to this species; from the Siwalik Hills.
Cautley Collection. Presented, 1842.

40871. A left upper cheek-tooth, provisionally referred to this species; from the Siwalik Hills.
Presented by C. Falconer, Esq., 1867.

M. 2497. Two right upper cheek-teeth, provisionally referred to this species; from Perim Island.
Presented by Azam Wajeshankar Gowreeshankar, Esq., 1885.

37390. The second left upper premolar, in a much-rolled condition; from Perim Island. *Presented by A. Rogers, Esq.*, 1863.

M. 2652. (*Fig.*) The greater portion of the mandible, showing the three premolars and m. 1; from the Siwalik Hills. Figured by Falconer and Cautley, *op. cit.* pl. lxxxii. figs. 14, 14 *a*.
Cautley Collection. Presented, 1842.

37258. Fragment of the left ramus of a mandible, with three cheek-teeth, provisionally referred to this species; from Perim Island. *Presented by Walter Ewer, Esq.*

M. 2652 a. Fragment of the right ramus of a mandible, with m. 2 and m. 3, provisionally referred to this species; from the Siwalik Hills. *Cautley Collection. Presented*, 1842.

M. 2653. (*Fig.*) The extremity of the mandible. Figured by Falconer and Cautley, *op. cit.* pl. lxxxii. figs. 15, 15 *a*.
Cautley Collection. Presented, 1842.

The specific reference of the following specimens is provisional; they are too small to have belonged to the Siwalik species of Equus. *Unless otherwise stated, they are from the Siwalik Hills, and belong to the Cautley Collection. Presented*, 1842.

M. 2657. (*Fig.*) The proximal third of the left radius. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiv. fig. 5.

M. 2658. (*Fig.*) The distal portion of the right radius. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiv. fig. 6.

M. 2659. (*Fig.*) The distal extremity of the left radius, with the associated carpus. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiv. fig. 7.

M. 2649. (*Fig.*) The left carpus and the proximal extremity of the metacarpus. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiv. fig. 8 (in conjunction with the distal portion of the radius).

M. 2650. (*Fig.*) The left third metacarpal. Figured by Falconer and Cautley, *op. cit.* pl. lxxiv. fig. 9. There are no facettes for lateral metacarpals at the distal extremity.

18006. (*Fig.*) The right metacarpus, imperfect distally. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiv. fig. 10. The second and fourth metacarpals do not extend below the middle of the third metacarpal.

M. 2458. The distal portion of the left carpus and the proximal portion of the metacarpus.

M. 2651. (*Fig.*) The distal extremity of the right femur. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiii. fig. 10 (as *Equus*). *Presented by Gen. Sir W. E. Baker, K.C.B.*, 1848.

40690. The distal extremity of a left femur, perhaps belonging to this species; from Perim Island. *Presented by C. Falconer, Esq.*, 1867.

23150. The distal extremity of a smaller left femur; from Perim Island. *Presented by Dr. Beust.*

16160 a, 16160 b. Two patellæ, the larger of which may belong to *H. theobaldi*.

40691. The distal extremity of a tibia, perhaps belonging to this species; from Perim Island.

Presented by C. Falconer, Esq., 1867.

M. 2654. (*Fig.*) The distal portion of the right tibia. Figured by Falconer and Cautley, *op. cit.* pl. lxxxv. fig. 9.

M. 2655. The distal portion of the left tibia, together with the associated tarsus and proximal extremity of the metatarsus.

M. 2656. (*Fig.*) The left astragalus. Figured by Falconer and Cautley, *op. cit.* pl. lxxxv. fig. 10.

M. 2660. (*Fig.*) The left calcaneum. Figured by Falconer and Cautley, *op. cit.* pl. lxxxv. fig. 18.

16680. (*Fig.*) The left tarsus, metatarsus, and proximal portion of the first phalangeal. Figured by Falconer and Cautley, *op. cit.* pl. lxxxv. fig. 11. The second and fourth metatarsals did not extend below the middle of the third metatarsal. The latter is longer and more slender than the corresponding bone of *H. gracile*, and thereby approaches *Equus*.

M. 2459. The distal portion of the left tarsus, and the associated proximal extremity of the third metatarsal.

16681. (*Fig.*) The left third metatarsal. Figured by Falconer and Cautley, *op. cit.* pl. lxxxv. fig. 12.

17865. (*Fig.*) The left second and third metatarsals. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiv. fig. 21.

18007. (*Fig.*) The associated distal extremity of a third metapodial, and first and second phalangeals. The first phalangeal is of a much more slender type than that of *H. gracile*, or than the corresponding bone provisionally referred to the small Punjab form (see the writer's 'Catalogue of Siwalik Vertebrata in the Indian Museum, Calcutta,' Part 1, p. 58, No. C. 171 [1885], where this specimen is referred to the present species). The present specimen is figured by Falconer and Cautley, *op. cit.* pl. lxxxv. fig. 13.

M. 2661. (*Fig.*) The first phalangeal. Figured by Falconer and Cautley, *op. cit.* pl. lxxxv. fig. 14.

17430. The first phalangeal.

M. 2662. The first phalangeal.

M. 2663. The second phalangeal. Figured by Falconer and Cautley, (*Fig.*) *op. cit.* pl. lxxxv. fig. 15.

M. 2700. The second phalangeal.

40626. The second phalangeal.

Presented by C. Falconer, Esq., 1867.

17956. The terminal phalangeal. Figured by Falconer and Cautley, (*Fig.*) *op. cit.* pl. lxxxv. fig. 16.

M. 2664. Portion of an innominate, perhaps belonging to the (*Fig.*) present species. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiii. fig. 8 (as *Equus*).

Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

39583. The sacrum and last lumbar vertebra, perhaps belonging to this species.

Presented by the Secretary of State for India, 1860.

Hipparion richthofeni, Koken [1].

This species has been founded on detached teeth which present a great resemblance to those of *H. antilopinum* (including the Punjab specimens figured by the present writer under that name), but yet show differences which are considered of specific value. The first and second upper true molars are relatively wide. The foot is unknown.

Hab. China.

28584. Several upper and lower cheek-teeth; from the Pliocene (?) of the south of China.

Presented by D. Hanbury, Esq., 1853.

Hipparion theobaldi, Lydekker [2].

Syn. *Sivalhippus theobaldi*, Lydekker [3].
Hippotherium theobaldi, Lydekker [4].

This species is considerably larger than the two preceding ones,

[1] Pal. Abhand. vol. iii. pt. 2, p. 39 (1885).
[2] Rec. Geol. Surv. Ind. vol. x. p. 31 (1877); *Sivalhippus.*
[3] *Loc. cit.*
[4] Palæontologia Indica, ser. 10, vol. ii. p. 81 (1882).

and it presents distinctive characters in the upper premolars; the plication of the enamel is comparatively slight, and the cement very thick externally. The foot[1] is stout and has three digits.

Hab. India and (?) China.

M. 2665. The second left lower premolar; from the Pliocene Siwaliks near Peshawar, Punjab, India.

Presented by Sir R. I. Murchison, Bart.

28585. A left upper cheek-tooth, provisionally referred to this species; from the Pliocene (?) of the south of China. This specimen agrees in size with the true molars of the specimen figured by the present writer in the 'Palæontologia Indica' (Mem. Geol. Surv. Ind.), ser. 10, vol. ii. pl. xi. fig. 3. *Presented by D. Hanbury, Esq.*, 1853.

37391. A left astragalus, perhaps belonging to this species; from the Siwaliks of Perim Island, Gulf of Cambay.

Presented by A. Rogers, Esq., 1863.

Genus **EQUUS**, Linn.[2]

Including *Hippidion*, Owen[3].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{(3-4)}{(3-4)}$, M. $\frac{3}{3}$. In existing species the first upper cheek-tooth is usually absent in the adult, but is retained in some extinct species; rarely the first tooth of the typical series is present in the lower jaw of young animals, as in one young example of *E. sivalensis* (No. 22108), and in another of *E. hemionus*[4]. The anterior "pillar" in the upper cheek-teeth is connected with the anterior inner "crescent" throughout its length, and there is but one digit to each foot. The so-called *Hippidion* is distinguished by the upper cheek-teeth having short and much-curved crowns, in which the anterior and posterior pillars are of equal size, and by the existence of a rudiment of the fifth metacarpal. These characters the writer is not disposed to consider of generic value; the great curvature of the crowns of the upper cheek-teeth is a character recalling *Toxodon* and *Nesodon*, andis unlike *Hipparion*. A maxillary fossa may be present (*E. andium* and *E. sivalensis*).

[1] 'Palæontologia Indica' (Mem. Geol. Surv. Ind.), ser. 10, vol. ii. pl. xii.

[2] Syst. Nat. ed. 12, vol. i. p. 100 (1766).

[3] Phil. Trans. for 1869, p. 572 (1870). As a subgenus.

[4] See Flower, Cat. Vert. Anim. Mus. R. Coll. Surg., pt. ii. Mammalia, p. 413, no. 2108 (1884).

Equus principalis, Lund [1].

Syn. *Equus macrognathus*, Weddell [2].
Equus neogæus, P. Gervais [3] (*non* Lund).
Hippidion principalis, Owen [4].
Equus arcidens, Owen [5].
Hippidion arcidens, Owen [6].

The writer follows Burmeister ('Die fossilen Pferde der Pampas-formation,' p. 61 [1875]) in identifying *E. arcidens* with the present form. The species is of larger size than *E. neogæus*, Lund, and has the crowns of the upper cheek-teeth very short, much curved, and with a small anterior "pillar," which is not larger than the posterior. The first upper premolar is present.

Hab. S. America.

40492. (*Fig.*) Five upper cheek-teeth; from the Pleistocene of Arroyo, Gutierrez, near Paysandu, Uruguay. These specimens are the types of *E. arcidens*, and are described and figured by Owen in the Phil. Trans. for 1869, p. 566, pl. lxii. figs. 1–8; they agree precisely with the corresponding teeth in the complete dental series figured by Burmeister, *op. cit.* pl. iii. fig. 3.

Presented by W. G. Lettsom, Esq., 1867.

18095. A left upper cheek-tooth; from a cavern in Minas Geraes, Brazil. *Claussen Collection. Purchased*, 1845.

Equus sivalensis, Falconer and Cautley [7].

This species, with which Forsyth-Major [8] identifies *Equus stenonis*, Cocchi [9], occurs in the Pliocene Siwaliks of India. The first upper cheek-tooth is frequently retained, and $\overline{\text{mm.}}\,\overline{1}$ is present in one instance, the anterior pillars of the upper true molars are very short antero-posteriorly (thereby indicating affinity with *Hipparion*); the diastema is shorter than in *E. caballus*, and there is a trace of a "larmial" depression on the maxilla. The cranium comes nearer

[1] K. Danske. Vid. Selsk. Skr. vol. xii. p. 89 (1846).
[2] Voyage dans le Sud de la Bolivie, p. 204 (1851, forming vol. vi. of Castelnau's Expedition, 'Hist. d. Voyage').
[3] Rech. s. Mam. Foss. de l'Amérique Méridionale, p. 33 (1855).
[4] Phil. Trans. for 1869, p. 573 (1870).
[5] *Loc. cit.* p. 559.
[6] *Loc. cit.* p. 572.
[7] 'Fauna Antiqua Sivalensis,' pt. 9, pl. lxxxi. (1849).
[8] Quart. Journ. Geol. Soc. vol. xli. p. 2 (1885).
[9] Mem. Soc. Ital. Sci. Nat. vol. ii. art. 7, p. 14 (1867).

to that of *E. hemionus* than to that of *E. caballus*, the premaxillæ being relatively short. The "splint-bones" did not unite with the third metapodial.

Hab. India.

16160. The cranium, broken off in front of pm. 3; from the Pliocene (*Fig.*) of the Siwalik Hills. This specimen is the type of the species, and is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. lxxxi. fig. 1; it is noticed by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pp. 87, 89.

Cautley Collection. Presented, 1842.

16227. Hinder portion of a cranium provisionally referred to this (*Fig.*) species; from the Siwalik Hills. Figured by Falconer and Cautley, *op. cit.* pl. lxxxi. fig. 2.

Cautley Collection. Presented, 1842.

M. 2666. Part of the left maxilla, containing the last five cheek- (*Fig.*) teeth; from the Siwalik Hills. Figured by Falconer and Cautley, *op. cit.* pl. lxxxii. fig. 3.

Cautley Collection. Presented, 1842.

M. 2698. The premaxillæ and mandibular symphysis, provisionally (*Fig.*) referred to this species; from the Siwalik Hills. Figured by Falconer and Cautley, *op. cit.* pl. lxxxii. fig. 5.

Cautley Collection. Presented, 1842.

22107. The middle portion of the right ramus of a mandible pro- (*Fig.*) bably belonging to the present species; from the Siwalik Hills. This specimen, which shows all the cheek-teeth, is figured by Falconer and Cautley, *op. cit.* pls. lxxxi. fig. 4, and lxxxii. fig. 2. *Presented by Col. Colvin. Before* 1846.

22108. The anterior portion of the mandible of a young individual (*Fig.*) probably belonging to the present species; from the Siwalik Hills. This specimen shows the three milk-molars of either side, and in advance of pm. 2 a small cylindrical alveolus for mm. 1. The specimen is figured by Falconer and Cautley, *op. cit.* pl. lxxxii. fig. 4.

Presented by Col. Colvin. Before 1846.

M. 2667. The extremity of the maxillary symphysis of a female, (*Fig.*) showing the six incisors and small canines; from the Siwalik Hills. Figured by Falconer and Cautley, *op. cit.* pl. lxxxii. fig. 6. *Cautley Collection. Presented*, 1842.

The following specimens, which indicate an animal somewhat smaller than the fossil race of E. caballus, *were all obtained from the Siwalik Hills; and, unless otherwise stated, belong to the Cautley Collection. Presented,* 1842.

M. 2668. The proximal portion of the left radius and ulna. Figured (*Fig.*) by Falconer and Cautley, *op. cit.* pl. lxxxiv. fig. 1.

M. 2669. The proximal half of the right radius. Figured by (*Fig.*) Falconer and Cautley, *op. cit.* pl. lxxxiv. fig. 2.

40826. The distal portion of the right radius.
Presented by C. Falconer, Esq., 1867.

M. 2670. Fragment showing the adjacent portions of the humerus, (*Fig.*) radius, and ulna, together with the left calcaneum. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiii. fig. 9.
Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

M. 2671. The right third metacarpal. Figured by Falconer and (*Fig.*) Cautley, *op. cit.* pl. lxxxiv. fig. 4.

M. 2672. The left femur. Figured by Falconer and Cautley, *op. cit.* (*Fig.*) pl. lxxxv. fig. 1.

36733. The proximal portion of the right femur. Figured by (*Fig.*) Falconer and Cautley, *op. cit.* pl. lxxxv. fig. 2.
Presented by the Secretary of State for India, 1860.

M. 2673. The distal extremity of the right femur. Figured by (*Fig.*) Falconer and Cautley, *op. cit.* pl. lxxxiii. fig. 11.
Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

17835. The left tibia. Figured by Falconer and Cautley, *op. cit.* (*Fig.*) pl. lxxxv. fig. 3.

M. 2674. The left calcaneum. Figured by Falconer and Cautley, (*Fig.*) *op. cit.* pl. lxxxv. fig. 5.

M. 2675. The left astragalus. Figured by Falconer and Cautley, (*Fig.*) *op. cit.* pl. lxxxv. fig. 6.

16681. The right third metatarsal. Figured by Falconer and (*Fig.*) Cautley, *op. cit.* pl. lxxxv. fig. 7.

17828. The right third metatarsal. Figured by Falconer and (*Fig.*) Cautley, *op. cit.* pl. lxxxiv. fig. 20.

M. 2676. A proximal phalangeal. Figured by Falconer and Caut- (*Fig.*) ley, *op. cit.* pl. lxxxv. fig. 8.

M. 2677. (*Fig.*) Portion of an innominate, with the distal extremity of a small metapodial attached; the former perhaps belonging to this species. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiii. fig. 7.

Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

M. 2678. (*Fig.*) The atlas vertebra. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiii. fig. 1.

Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

M. 2679. (*Fig.*) A cervical vertebra. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiii. fig. 2.

Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

M. 2680. (*Fig.*) A cervical vertebra. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiii. fig. 3.

Presented bp Gen. Sir W. E. Baker, K.C.B., 1848.

M. 2681. (*Fig.*) A cervical vertebra. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiii. fig. 5.

Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

M. 2682. (*Fig.*) An early dorsal vertebra. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiii. fig. 7.

Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

Equus stenonis, Cocchi [1].

Syn. *Equus magnus*, Bravard, MS.

As already mentioned (*supra*, p. 66) this species has been identified by Forsyth-Major with *E. sivalensis*, but the evidence for this appears to the writer to be at present insufficient. The anterior pillars of the upper cheek-teeth are short antero-posteriorly, and the enamel is plicated in the central islets; the "splint-bones" did not unite with the third metapodials, those of the fore foot being less reduced in size than those of the hind foot.

Hab. Europe and Algeria [2].

28812. Two upper cheek-teeth; from the Upper Pliocene of the Val d'Arno, Italy.

Presented by J. B. Pentland, Esq., 1853.

33470 a. A left upper cheek-tooth provisionally referred to this species; dredged off Happisburgh, Norfolk, and probably derived from the Forest-bed.

Layton Collection. Purchased, 1858.

[1] Mem. Soc. Ital. Sci. Nat. vol. ii. art. 7, p. 14 (1867).

[2] Thomas, Mém. Soc. Géol. France, sér. 3, vol. iii. art. 2, pl. ix. (iii.) (1884).

34636. The left lower cheek-dentition; from the Upper Pliocene of Mont Perrier, near Issoire (Puy-de-Dôme), France. This specimen agrees precisely with the one figured by Forsyth-Major in the "Geschichte der foss. Pferde, &c." (Abh. schw. pal. Ges. vol. vii.) pt. 2, pl. vii. fig. 22; it was named in MS. *E. magnus* by Bravard. This specimen presents a great resemblance to the mandible of *E. sivalensis*, No. 23107, but the molars are relatively wider.

Bravard Collection. Purchased, 1852.

28813. Part of the left ramus of a mandible, containing the four middle cheek-teeth, provisionally referred to this species; from the Upper Pliocene of the Val d'Arno.

Presented by J. B. Pentland, Esq., 1853.

The reference of some of the following specimens is provisional; those from Perrier were referred by Bravard to his E. magnus.

28844. The distal half of the left humerus and the associated radius and ulna; from the Upper Pliocene of the Val d'Arno.

Presented by J. B. Pentland, Esq., 1853.

34644. The distal half of the left humerus; from the Upper Pliocene of Mont Perrier.

Bravard Collection. Purchased, 1852.

28815. The left third metacarpal; from the Upper Pliocene of the Val d'Arno. This bone agrees precisely in length with the corresponding bone of *E. sivalensis*, but is somewhat stouter. *Presented by J. B. Pentland, Esq.*, 1853.

28815 a. A third metacarpal of a smaller individual, wanting the proximal extremity; from the Upper Pliocene of the Val d'Arno. *Presented by J. B. Pentland, Esq.*, 1853.

34646. The right femur, wanting the distal extremity; from the Upper Pliocene of Mont Perrier.

Bravard Collection. Purchased, 1852.

28814. The right astragalus; from the Upper Pliocene of the Val d'Arno. *Presented by J. B. Pentland, Esq.*, 1853.

34650. The right astragalus; from the Upper Pliocene of Mont Perrier. *Bravard Collection. Purchased*, 1852.

33470 b. The articular half of a very large right calcaneum; dredged off Happisburgh, Norfolk, and probably derived from the Forest-bed.

Layton Collection. Purchased, 1858.

28816. The left third metatarsal; from the Upper Pliocene of the Val d'Arno. This bone is shorter and stouter than either of the corresponding bones of *E. sivalensis*.
Presented by J. B. Pentland, Esq., 1853.

34651. The left third metatarsal; from the Upper Pliocene of Mont Perrier. *Bravard Collection. Purchased*, 1852.

34652. The right third metatarsal; from the Upper Pliocene of Mont Perrier. *Bravard Collection. Purchased*, 1852.

34653. The right third metatarsal; from the Upper Pliocene of Mont Perrier. *Bravard Collection. Purchased*, 1852.

28817. A first phalangeal; from the Upper Pliocene of the Val d'Arno. *Presented by J. B. Pentland, Esq.*, 1853.

28818. The terminal phalangeal of a hind foot; from the Upper Pliocene of the Val d'Arno.
Presented by J. B. Pentland, Esq., 1853.

28843. An imperfect cervical vertebra; from the Upper Pliocene of the Val d'Arno. *Presented by J. B. Pentland, Esq.*, 1853.

28843 a. The hinder half of a cervical vertebra; from the Upper Pliocene of the Val d'Arno.
Presented by J. B. Pentland, Esq., 1853.

34643. The dorsal half of a cervical vertebra; from the Upper Pliocene of Mont Perrier.
Bravard Collection. Purchased, 1852.

Equus namadicus, Falconer and Cautley [1].

Syn. (?) *Equus palæonus*, Falconer and Cautley [2].

This species was originally determined from the Pleistocene Narbadas, but has been recorded by the present writer in the 'Palæontologia Indica' (Mem. Geol. Surv. Ind.), ser. 10, vol. ii. pl. xiv., from the Pliocene Siwaliks. It differs from *E. sivalensis* by the greater antero-posterior length of the anterior pillars of the cheek-teeth, by the square crowns of the upper milk-molars, and the relatively longer premaxillæ; all these being more specialized characters. The first upper premolar is often present, although not so frequently as in *E. sivalensis*. *E. palæonus* was founded on immature specimens provisionally referred to the present species.

Hab. India.

[1] 'Fauna Antiqua Sivalensis,' pt. 9, pl. lxxxi. (1849).

[2] *Loc. cit.*

M. 2683. (*Fig.*) The cranium, imperfect anteriorly; from the Pleistocene of the Narbada Valley, India. This specimen is the type, and is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. lxxxi. fig. 5.

Presented by C. Fraser, Esq. Before 1843.

M. 2684. (*Fig.*) Part of the left maxilla, containing all the cheek-teeth except pm. 1 (of which there is no trace); from the Narbada Valley. Figured by Falconer and Cautley, *op. cit.* pl. lxxxii. fig. 7.

Presented by C. Fraser, Esq. Before 1843.

16171. (*Fig.*) A left maxilla provisionally referred to the present species; from the Pliocene of the Siwalik Hills. This specimen (which is of very large size) has been figured (reversed) by Falconer and Cautley, *op. cit.* pl. lxxxii. fig. 1, under the name of *E. sivalensis*; but (on account of the large antero-posterior diameter of the anterior pillars) has been provisionally referred by the present writer, in the 'Palæontologia Indica,' ser. 10, vol. ii. pp. 94, 95, to the present species. *Cautley Collection. Presented,* 1842.

M. 2685. (*Fig.*) The extremity of the premaxillæ of a young female; from the Narbada Valley. Figured by Falconer and Cautley, *op. cit.* pl. lxxxii. fig. 10, under the name of *E. palæonus*, of which it is the type.

Presented by C. Fraser, Esq. Before 1843.

M. 2686. (*Fig.*) The extremity of the premaxillæ of an old individual. Figured by Falconer and Cautley, *op. cit.* pl. lxxxii. fig. 9, as *E. palæonus*.

Presented by C. Fraser, Esq. Before 1843.

M. 2687. (*Fig.*) The middle portion of the left ramus of the mandible, showing the six cheek-teeth; from Narsingpúr, Narbada Valley. Figured by Falconer and Cautley, *op. cit.* pl. lxxxii. fig. 8.

Presented by C. Fraser, Esq. Before 1843.

M. 2688 Part of the left ramus of the mandible, showing the three premolars; from near Jhánsi, Narbada Valley.

Presented by C. Fraser, Esq. Before 1843.

M. 2689. (*Fig.*) Part of the left ramus of the mandible of a young individual, showing the three milk-molars; from the Narbada

Valley. Figured by Falconer and Cautley, *op. cit.* pl. lxxxii. fig. 11, as *E. palæonus*.

Presented by C. Fraser, Esq. Before 1843.

M. 2690. Part of the right ramus of an old individual of a small-sized species of *Equus*, showing the last four cheek-teeth; from the Narbada Valley. It is not improbable that this specimen is specifically distinct from *E. namadicus*.

Presented by C. Fraser, Esq. Before 1843.

M. 2691. (*Fig.*) The right radius; from near Narsingpúr. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiv. fig. 13.

Presented by C. Fraser, Esq. Before 1843.

M. 2692. (*Fig.*) A smaller left radius; from the Narbada Valley. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiv. fig. 14.

Presented by C. Fraser, Esq. Before 1843.

M. 2693. A cervical vertebra; from the Narbada Valley.

Presented by C. Fraser, Esq. Before 1843.

Equus caballus, Linn.[1]

Including:—*Equus adamiticus*, Schlotheim[2].
Equus brevirostris, Kaup[3].
Equus fossilis, Meyer[4].
Equus plicidens, Owen[5].
Equus spelæus, Owen[6].

As the writer has been unable to specifically distinguish the specimens referred to the foregoing forms from *E. caballus*, they are all provisionally referred to that species; but it is quite probable that they may really belong to more than one species, as it has been shown by Leidy, Rütimeyer, and others that it is impossible to distinguish the teeth and bones of many of the existing *Equidæ* from one another. In a memoir on the Pleistocene horses of Europe, Nehring[7] refers the great majority of the specimens examined by him to *E. caballus*, but says that there is also good evidence of the existence of *E. hemionus*. In the Pleistocene race of the present

[1] Syst. Nat. ed. 12, vol. i. p. 100 (1766).
[2] Die Petrefactenkunde, p. 11 (1820).
[3] Neues Jahrb. 1833, p. 518.
[4] Palæologica, p. 72 (1832).
[5] Rep. Brit. Assoc. for 1843, p. 231 (1844).
[6] Phil. Trans. for 1869, p. 544 (1870).
[7] "Fossile Pferde aus deutschen Diluvial-Ablagerungen, &c." Landwirt. Jahrb. 1884, pp. 81–160.

species the "splint-bones" did not unite with the third metapodial. The specimens in the Museum indicate a great variation in size; those from the Pleistocene of Essex and Kent belonging to a very large race, while those from the Brighton "elephant-bed" are equally small, and some of the latter may perhaps belong to *E. hemionus*. Variations in the form of the proximal articular surface of the third metatarsal are noticeable in some instances.

In the typical form the long diameter of the anterior "pillar" of the upper cheek-teeth is equal to more than one third the length of the crown; the crowns are nearly straight and square; the enamel-plications are usually not very complex, there is no maxillary fossa, and the maxilla is produced much behind m. 3.

Hab. As a domestic animal, the greater part of the world; in the Pleistocene, Europe and Arctic America.

45290. The parieto-frontal half of the cranium; from the Pleistocene of Ilford, Essex.
Brady Collection. Purchased, 1878.

41546. The cranium of a male about five years old; from the turbary of Walthamstow, Essex. A very minute pm. 1 is present on the left side. *Purchased*, 1869.

41545. The cranium of a female about six and a half years old; from the turbary of Walthamstow. *Purchased*, 1869.

41547. The cranium of a female of about the same age as the last; from the turbary of Walthamstow. *Purchased*, 1869.

41548. The cranium of a young individual; from the turbary of Walthamstow. The alveolus of a very minute mm. 1 is present on both sides; the normal three milk-molars and m. 1 are in use, while m. 2 is just protruding from its alveolus. *Purchased*, 1869.

46094–5. Two specimens of the occipital portion of the cranium: dredged off the Eastern coast. (? *E. stenonis*.)
Owles Collection. Purchased, 1874.

47633. (*Fig.*) The middle portion of the cranium of a young individual; from a cavern in Windmill Hill, Gibraltar. This specimen is figured by Busk in the Trans. Zool. Soc. vol. x. pl. vii. fig. 2; it shows the alveolus of mm. 1, and the three succeeding milk-molars of the left side, and on the right side mm. 2 and mm. 3. *Brome Collection. Presented*, 1876.

23742 e. The palate of a young individual, showing on the right side the normal three milk-molars and m. 1 *in alveolo*, and

on the left mm. 3, mm. 4, and m. 1; from the Pleistocene of Slade Green, near Erith, Kent. *Purchased*, 1849.

34657. The six associated cheek-teeth of the left side; from the Pleistocene (?) Alluvium of Tour-de-Boulade (Puy-de-Dôme), France. This and the other specimens from the same locality are the types of Bravard's (MS.) *Equus juvillacus*, but the writer has been unable to distinguish them from the existing species.

Bravard Collection. *Purchased*, 1852.

34658. Fragment of the left maxilla, showing the last five cheek-teeth; from the Alluvium of Tour-de-Boulade.

Bravard Collection. *Purchased*, 1852.

38168. (*Fig.*) Part of the left maxilla, showing the normal six cheek-teeth; from the cavern of Bruniquel (Tarn-et-Garonne), France. This specimen is described and figured by Owen in the Phil. Trans. for 1869, p. 544, pl. lx. fig. 2, under the name of *Equus spelæus*, of which (together with the other specimens from the same locality) it is the type.

Purchased, 1864.

38169. (*Fig.*) Part of the right maxilla, showing the normal six cheek-teeth; from the cavern of Bruniquel. Described and figured by Owen, *op. cit.* pl. lx. fig. 3, as *E. spelæus*.

Purchased, 1864.

38175. (*Fig.*) Fragment of the left maxilla of an immature individual; from the cavern of Bruniquel. This specimen shows pm. 2 and pm. 3 *in alveolo*, and the much worn mm. 3 and mm. 4. It is described and figured by Owen, *op. cit.* pl. lx. figs. 5, 6, under the name of *E. spelæus*. *Purchased*, 1864.

38175 a. Fragment of the left maxilla of a young individual, showing mm. 2, mm. 3, and the alveolus of mm. 1; from the cavern of Bruniquel. *Purchased*, 1864.

38171. (*Fig.*) Part of the right maxilla of an immature individual, showing the last four cheek-teeth (pm. 4 and m. 3 not fully protruded); from the cavern of Bruniquel. Described and figured by Owen, *op. cit.* pl. lx. fig. 4, as *E. spelæus*.

Purchased, 1864.

M. 2701. Part of the right maxilla, showing the last five cheek-teeth; from an English Pleistocene deposit. *No history.*

16812. Fragment of the right maxilla, containing two cheek-teeth; from Kent's Cavern, Torquay, Devonshire.
McEnery Collection. Purchased, 1842.

18757, 21291, 21646, 22032. Numerous detached cheek-teeth of very large size; from the Pleistocene of Grays, Essex.
Purchased.

45291–45296. Six detached upper cheek-teeth; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

18982. Three upper cheek-teeth; from Kent's Cavern. In the complex plication of the enamel these specimens agree with the so-called *E. plicidens* of Owen.
Presented by Rev. Upton Richards, 1845.

18982 a. Numerous upper cheek-teeth; from Kent's Cavern.
Presented by Rev. Upton Richards, 1845.

7262, 7263, 7266, 7272, 7274, 8443. Numerous cheek-teeth; from the Pleistocene ("elephant-bed") of Brighton, Sussex.
Mantell Collection. Purchased, 1836.

27624. Two upper cheek-teeth; from the Pleistocene (?) Alluvium of La Combette, near Champeix (Puy-de-Dôme), France.
Croizet Collection. Purchased, 1848.

M. 2702. Two upper cheek-teeth; from the Pleistocene of Essen, Westphalia. *Enniskillen Collection. Purchased*, 1882.

36920. Three detached teeth of a small form; from the Pleistocene fissures of Oreston, near Plymouth, Devonshire. These agree in size with the specimens from the same locality figured in Owen's 'British Fossil Mammals and Birds,' p. 396, figs. 157, 158, under the name of *Asinus fossilis*.
Purchased, 1862.

47635–6. Fragments of the maxilla and detached cheek-teeth; from the caverns of Gibraltar.
Brome Collection. Presented, 1876.

23713. Numerous detached cheek-teeth; from the Pleistocene of Slade Green. *Purchased*, 1849.

33470. Numerous detached cheek-teeth; dredged off Happisburgh, Norfolk (some of these may belong to *E. stenonis*).
Layton Collection. Purchased, 1858.

27864. Three upper cheek-teeth; from the Pleistocene of Felixstowe, Suffolk. *Presented by John Brown, Esq.*, 1852.

16002–3. Two upper cheek-teeth; from the Pleistocene of Sutton, near Peterborough, Northampton. *Purchased*, 1842.

27951. A right upper cheek-tooth; from the Pleistocene of Clacton, Essex. *Presented by John Brown, Esq.*, 1852.

44024. A left upper cheek-tooth; from the Pleistocene of Godmanchester, Huntingdonshire. *Purchased*, 1859.

41552. Part of the mandible, showing the six cheek-teeth of the right, and the first four of the left side; from the turbary of Walthamstow. *Purchased*, 1869.

41553. The hinder part of the right ramus of the mandible, showing the six cheek-teeth; from the turbary of Walthamstow. *Purchased*, 1869.

27511. Part of the right ramus and symphysis of the mandible of an old individual; from a bog at Kyson, near Woodbridge, Suffolk. *Purchased*, 1852.

45297. Fragment of the right ramus of the mandible, containing the six cheek-teeth; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

45298. Fragment of the left ramus of the mandible, containing the three premolars; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

23743 e. Part of the left ramus of the mandible, containing the three premolars; from the Pleistocene of Slade Green. *Purchased*, 1849.

20819. The hinder part of the left ramus of the mandible, containing the three true molars; from the Pleistocene of Grays, Essex. *Purchased*, 1847.

16810. Part of the left ramus of the mandible, showing the first five cheek-teeth; from Kent's Cavern. *McEnery Collection. Purchased*, 1842.

15637. (*Fig.*) Part of the right ramus of the mandible, with the last five cheek-teeth; from Kent's Cavern. Figured in McEnery's 'Cavern Researches,' pl. K. fig. 6. *McEnery Collection. Purchased*, 1842.

38182. (*Fig.*) Part of the left ramus of the mandible, showing the six cheek-teeth; from the cavern of Bruniquel. Figured by Owen in the Phil. Trans. for 1869, pl. lvii. fig. 5, as *E. spelæus*. *Purchased*, 1864.

38184. Part of the right ramus of the mandible with the six cheek-teeth; from the cavern of Bruniquel. *Purchased*, 1864.

38187. (*Fig.*) Part of the left ramus of the mandible, showing the canine and the first four cheek-teeth; from the cavern of Bruniquel. Figured by Owen, *op. cit.* pl. lvii. fig. 8, as *E. spelæus*. *Purchased*, 1864.

27744. Part of the right ramus of the mandible, containing the last four cheek-teeth; from the Pleistocene (?) Alluvium of Tour-de-Boulade (Puy-de-Dôme), France.
Croizet Collection. *Purchased*, 1848.

34659. The hinder part of the right ramus of the mandible; from Tour-de-Boulade. This and the following specimens from the same locality belong to Bravard's *E. juvillacus*.
Bravard Collection. *Purchased*, 1852.

34660. Part of the right ramus of the mandible, with the six cheek-teeth; from Tour-de-Boulade.
Bravard Collection. *Purchased*, 1852.

34661. Part of the left ramus of the mandible, with the six cheek-teeth; from Tour-de-Boulade.
Bravard Collection. *Purchased*, 1852.

34662. Fragment of the right ramus of the mandible, with m.2 and m. 3; from Tour-de-Boulade.
Bravard Collection. *Purchased*, 1852.

34663. The symphysis and part of the left ramus of the mandible; from Tour-de-Boulade.
Bravard Collection. *Purchased*, 1852.

34664. Part of the left ramus of the mandible, containing the six cheek-teeth; from Tour-de-Boulade.
Bravard Collection. *P rchased*, 1852.

34665. Part of the right ramus of the mandible, with the six cheek-teeth; from Tour-de-Boulade.
Bravard Collection. *Purchased*, 1852.

34666. Part of the right ramus of the mandible, with the last four cheek-teeth; from Tour-de-Boulade.
Bravard Collection. *Purchased*, 1852.

44071. Part of the right ramus of the mandible of a young individual, containing mm. 3, mm. 4, and the alveolus of

$\overline{\text{m. 1}}$; from the Pleistocene of the Porcupine River, Dominion of Canada.

Presented by Rev. R. McDonald, 1873.

38175 b. (*Fig.*) The symphysis and portion of the left ramus of the mandible of a young individual; from the cavern of Bruniquel. Figured by Owen in the Phil. Trans. for 1869, pl. lvii. fig. 7, under the name of *E. spelæus*. *Purchased*, 1864.

18982. Symphysis of the mandible of an immature individual; from Kent's Cavern.

McEnery Collection. *Purchased*, 1842.

28053. Part of the symphysis of the mandible, showing four incisors; from the Pleistocene of Grays.

Presented by John Brown, Esq., 1852.

45299–45301. Three detached lower cheek-teeth; from the Pleistocene of Ilford. *Brady Collection*. *Purchased*, 1878.

20819. The left half of the symphysis and part of the ramus of the mandible of a young individual; from the Pleistocene of Grays. The three incisors and the first premolar are exhibited *in alveolo*. *Purchased*, 1847.

29654. The second right lower premolar, of large size; from the Pleistocene of Eppelsheim, Hessen-Darmstadt (*E. adamiticus*). *Hastings Collection*. *Purchased*, 1855.

27896. The second right lower premolar, of small size; from the Pleistocene of Clacton.

Presented by John Brown, Esq., 1852.

43626. Two lower cheek-teeth; from the Pleistocene of Schweinfurt, Bavaria. *Purchased*, 1859.

M. 64. Three lower cheek-teeth; from the Pleistocene of Applecake Hill, Bickly, Knighton-on-Teme, Worcestershire.

Purchased, 1880.

43608. Numerous detached teeth; from a raised beach at Weston-super-Mare, Somersetshire.

Presented by E. C. H. Day, Esq., 1866.

40388. Three detached cheek-teeth; from the Pleistocene of Oundle, Northampton. *Presented by G. M. Edmonds, Esq.*, 1867.

45304. The left scapula, imperfect distally; from the Pleistocene of Ilford. *Brady Collection*. *Purchased*, 1878.

47639. The greater part of the right scapula; from the Genista (*Fig.*) Cave, Gibraltar. Figured by Busk in the Trans. Zool. Soc. vol. x. pl. viii. *Brome Collection. Presented*, 1876.

45305. The right humerus; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

18103. The right humerus; from a bog in Ireland. *Purchased*, 1842.

47640. The proximal extremity of the right humerus; from the (*Fig.*) Genista Cave, Gibraltar. Figured by Busk in the Trans. Zool. Soc. vol. x. pl. ix. fig. 1. *Brome Collection. Presented*, 1876.

23121. The distal two thirds of the right humerus; from the Pleistocene in the neighbourhood of Maidstone, Kent. *Purchased*, 1849.

23765. The distal third of the right humerus; from the Pleistocene of Slade Green. *Purchased*, 1849.

28575. The left radius and ulna; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

45306. The left radius; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

7302. The left radius; from the Pleistocene of Brighton. *Mantell Collection. Purchased*, 1836.

27885. The left radius; from the Pleistocene of Walton-on-the-Naze, Essex. *Presented by John Brown, Esq.*, 1852.

16 (O. C.). The left radius; from the Pleistocene of Eschscholtz (*Fig.*) Bay, Kotzebue Sound, Alaska. Figured in F. W. Beechey's 'Voyage to the Pacific and Behring's Straits in H.M.S. 'Blossom' during the years 1825 to 1828,' vol. ii. pl. iii. (Fossils), fig. 13. *Presented by Capt. F. W. Beechey, R.N.*

28580. The right radius; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

23752 e. The distal half of the left radius; from the Pleistocene of Slade Green. *Purchased*, 1849.

36605. The right scaphoid; from the Pleistocene of Grays. *Purchased*, 1855.

23149. The right unciform; from the Pleistocene of Grays.
Purchased, 1849.

36604. The right unciform; from the Pleistocene of Grays.
Purchased, 1855.

45307. The right third metacarpal, from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

37121. The right third metacarpal; from the Pleistocene of Erith, Kent. *Purchased*, 1863.

37121 a. The right third metacarpal; from Erith.
Purchased, 1863.

27993. The right third metacarpal; from the Pleistocene of Walton.
Presented by John Brown, Esq., 1852.

215 k (O. C.). The right third metacarpal; from the Pleistocene fissures of Oreston.
Presented by William Clift, Esq. Before 1836.

27624. The right metacarpus; from the Pleistocene (?) Alluvium of La Combette, near Champeix. This and other specimens from the same locality are of a very wide type.
Croizet Collection. Purchased, 1848.

18982 b. The right third metacarpal; from Kent's Cavern.
Presented by Rev. Upton Richards, 1845.

28581. The right third metacarpal; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

28581 a. The right third metacarpal; from a cavern in Sundwig.
Purchased, 1853.

45308. The left third metacarpal; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

45309. The left third metacarpal; from Ilford.
Brady Collection. Purchased, 1878.

45310. The left third metacarpal; from Ilford.
Brady Collection. Purchased, 1878.

23726 e. The left third metacarpal; from the Pleistocene of Slade Green. *Purchased*, 1849.

37121. The left third metacarpal; from the Pleistocene of Erith.
Purchased, 1863.

27932. The left third metacarpal; from the Pleistocene of Walton.
Presented by John Brown, Esq., 1852.

27624 a. Two specimens of the left third metacarpal (one having the second metacarpal attached); from the Alluvium of La Combette. *Croizet Collection. Purchased*, 1848.

16885. The left third metacarpal; from Kent's Cavern.
McEnery Collection. Purchased, 1842.

28581 b. The left second and third metacarpals; from a cavern in Sundwig. *Purchased*, 1853.

218 b (O. C.). The left third metacarpal, of small size; from the Pleistocene of Eschscholtz Bay.
Presented by Capt. F. W. Beechey, R.N.

41565. The terminal phalangeal of a fore foot; from the turbary of Walthamstow. *Purchased*, 1869.

41566. The terminal phalangeal of a fore foot; from the turbary of Walthamstow. *Purchased*, 1869.

34688. The terminal phalangeal of a fore foot; from the Pleistocene (?) of Tour-de-Boulade (*E. juvillacus*, Brav.).
Bravard Collection. Purchased, 1852.

45314. The pelvis; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

45315. Part of the right innominate; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

27634. Part of the left innominate; from the Pleistocene (?) of La Combette. *Croizet Collection. Purchased*, 1848.

47641. (*Fig.*) Part of the left innominate; from the Genista Cave, Gibraltar. Figured by Busk in the Trans. Zool. Soc. vol. x. pl. xviii. fig. 3. *Brome Collection. Presented*, 1876.

46101. The right femur; dredged off the Dogger Bank.
Owles Collection. Purchased, 1874.

21293. The proximal half of the left femur; from the Pleistocene of Grays. *Purchased*, 1847.

45316. The distal half of the right femur; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

27629. The distal third of a smaller right femur; from the Pleistocene (?) of La Combette.
Croizet Collection. Purchased, 1848.

18968. The distal third of the left femur; from the Pleistocene of Grays. *Purchased*, 1845.

27969. The distal third of the left femur; from the Pleistocene of Walton. *Presented by John Brown, Esq.*, 1852.

39286. The distal third of the left femur; from a superficial deposit at Saffron Walden, Essex.
Presented by G. E. Roberts, Esq., 1865.

43710. The left patella; from the Pleistocene fissures of Oreston.
P rchased, 1872.

37129. The right tibia; from the Pleistocene of Erith.
Purchased, 1863.

24576. The right tibia, imperfect proximally; from the Pleistocene of Kotzebue Sound, Alaska.
Presented by Capt. Kellett and Lieut. Wood, R.N., 1850.

24576. The distal two thirds of the right tibia; from the Pleistocene of Kotzebue Sound.
Presented by Capt. Kellett and Lieut. Wood, 1850.

45317. The shaft of the tibia of a young individual; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

40965. The left tibia; from the Pleistocene of Crayford, Kent.
Purchased, 1868.

34689. The left tibia, imperfect proximally; from the Pleistocene (?) of Issoire (Puy-de-Dôme), France. This specimen is referred by Bravard to his *E. juvillacus*.
Bravard Collection. Purchased, 1852.

28033. The left calcaneum; from the Pleistocene of Clacton, Essex.
Presented by John Brown, Esq., 1852.

21292. The right calcaneum; from the Pleistocene of Grays.
Purchased, 1847.

215 h (O. C.). The right calcaneum, of smaller size; from the Pleistocene fissures of Oreston.
Presented by William Clift, Esq. Before 1836.

22027. The left calcaneum; from the Pleistocene of Erith.
Purchased, 1848.

36602. The right astragalus; from the Pleistocene of Grays.
Purchased, 1855.

36920. The right astragalus, of very large size; from the Pleistocene fissures of Oreston. *Purchased*, 1862.

21292 a. The right astragalus, slightly smaller than the last; from the Pleistocene of Grays. *Purchased*, 1847.

21292 b. The right astragalus; from the Pleistocene of Grays.
Purchased, 1847.

45327. The right astragalus; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

18982 c. The right astragalus; from Kent's Cavern.
Presented by Rev. Upton Richards, 1845.

34690. The right astragalus; from the Pleistocene (?) of Tour-de-Boulade. This specimen is referred by Bravard to his *E. juvillacus*. *Bravard Collection. Purchased*, 1852.

7333. Two specimens of the right astragalus; from the Pleistocene of Brighton. These are of small size.
Mantell Collection. Purchased, 1836.

36920 a. The left astragalus; from the Pleistocene fissures of Oreston.
Purchased, 1862.

18280. The left astragalus; from Kent's Cavern.
McEnery Collection. Purchased, 1842.

216 a (O. C.). The left astragalus; from the Pleistocene of Eschscholtz Bay. *Presented by Captain F. W. Beechey, R.N.*

7339. Two specimens of the left astragalus; from the Pleistocene of Brighton. *Mantell Collection. Purchased*, 1836.

23725 e. The right third metatarsal; from the Pleistocene of Slade Green. *Purchased*, 1849.

45319. The right third metatarsal; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

45320. The right third metatarsal, wanting the distal extremity; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

45322. The right third metatarsal; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

27932. The right third metatarsal; from the Pleistocene of Walton.
Presented by John Brown, Esq., 1852.

27932 a. The right third metatarsal; from the Pleistocene of Walton.
Presented by John Brown, Esq., 1852.

18982 d. The right third metatarsal; from Kent's Cavern.
Presented by Rev. Upton Richards, 1845.

28581. The right third metatarsal; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

7259. The right third metatarsal; from a depth of 45 feet below the surface in the Western Road, Brighton. This specimen is of small size. *Mantell Collection. Purchased*, 1836.

34699. Two specimens of the right third metatarsal; from the Pleistocene (?) of Tour-de-Boulade (*E. juvillacus*, Brav.).
Bravard Collection. Purchased, 1852.

218 a (O. C.). The right third metatarsal; from the Pleistocene of Eschscholtz Bay.
Presented by Capt. F. W. Beechey, R.N.

40966. The left third metatarsal; from the Pleistocene of Crayford.
Purchased, 1866.

37122. The left third metatarsal; from the Pleistocene of Erith.
Purchased, 1863.

23725 e. The left third metatarsal; from the Pleistocene of Slade Green. *Purchased*, 1849.

45321. The left third metatarsal; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

7295. Four specimens of the left third metatarsal; from the Pleistocene of Brighton. All are of small dimensions.
Mantell Collection. Purchased, 1836.

28820. The left third metatarsal; from the Pleistocene of the Valley of the Thames. *Purchased.*

18982 e. The left third metatarsal; from Kent's Cavern.
Presented by Rev. Upton Richards, 1845.

16884. Two specimens of the left third metatarsal; from Kent's Cavern. *McEnery Collection. Purchased*, 1842.

40389. The left third metatarsal; from the Pleistocene of Oundle, Northampton. *Presented by G. M. Edmonds, Esq.*, 1867.

18094. The left third metatarsal; from a bog in Ireland. The proximal extremity is diseased. *Purchased*, 1842.

28581. The left third metatarsal; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

27624. The left third metatarsal; from the Pleistocene (?) of La Combette. *Croizet Collection. Purchased*, 1848.

34700. The left third metatarsal; from the Pleistocene (?) of Tour-de-Boulade (*E. juvillacus*).
Bravard Collection. Purchased, 1852.

34697. The left third metatarsal; from the Pleistocene of Tour-de-Boulade (*E. juvillacus*).
Bravard Collection. Purchased, 1852.

44073. The proximal two thirds of the left third metatarsal; from the Pleistocene of the Porcupine River, Canada.
Presented by Rev. R. McDonald, 1873.

45311–2. Two first phalangeals; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

47643. A first phalangeal; from a cavern in Gibraltar. Figured by (*Fig.*) Busk, *op. cit.* pl. vii. fig. 3.
Brome Collection. Presented, 1876.

45323. A first phalangeal (imperfect); from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

23727 e. A first phalangeal (imperfect); from the Pleistocene of Erith. *Purchased*, 1849.

37123. A first phalangeal; from the Pleistocene of Erith.
Purchased, 1863.

36434. A first phalangeal; from the Pleistocene of Ipswich, Suffolk. *Brown Collection. Presented by Sir R. Owen, K.C.B.*, 1859.

40967. A first phalangeal; from the Pleistocene of Crayford.
Purchased, 1868.

40391. A first phalangeal; from the Pleistocene of Oundle.
Presented by G. M. Edmonds, Esq., 1867.

215 i (O. C.). A first phalangeal; from the Pleistocene fissures of Oreston.
Presented by William Clift, Esq. Before 1836.

34680–1. Two first phalangeals; from the Pleistocene (?) of Tour-de-Boulade (*E. juvillacus*).
Bravard Collection. *Purchased*, 1852.

44074. A first phalangeal; from the Pleistocene of the Porcupine River. *Presented by Rev. R. McDonald*, 1873.

7341. A first phalangeal; from the Pleistocene of Brighton.
Mantell Collection. *Purchased*, 1836.

M. 422. The proximal two thirds of a first phalangeal; from the Pleistocene of Hessle.
Enniskillen Collection. *Purchased*, 1882.

34656. The first phalangeal of an *Equus*; from the Upper Pliocene or Pleistocene of Puy-de-Dôme, France. This specimen was named by Bravard in MS. *E. elatus*.
Bravard Collection. *Purchased*, 1852.

45313. A second phalangeal; from the Pleistocene of Ilford.
Brady Collection. *Purchased*, 1878.

37123 a. A second phalangeal; from the Pleistocene of Erith.
Purchased, 1863.

34685. A second phalangeal; from the Pleistocene (?) of Tour-de-Boulade (*E. juvillacus*, Brav.).
Bravard Collection. *Purchased*, 1852.

36603. The terminal phalangeal of a hind foot; from the Pleistocene of Grays. *Purchased*, 1855.

7220. The terminal phalangeal of a hind foot; from the Pleistocene of Brighton. *Mantell Collection.* *Purchased*, 1836.

34716. The terminal phalangeal of a hind foot; from the Pleistocene (?) of Tour-de-Boulade (*E. juvillacus*, Brav.).
Bravard Collection. *Purchased*, 1852.

47644. Two terminal phalangeals belonging to very young animals; from the Genista Cave, Gibraltar.
Brome Collection. *Purchased*, 1876.

M. 1619. The atlas vertebra of a very large form; from the Pleistocene of Weimar.
Presented by C. Westendarp, Esq., 1884.

41774. The atlas vertebra; from the turbary of Walthamstow.
Purchased, 1869.

34669. The atlas vertebra; from the Pleistocene (?) of Tour-de-Boulade (*E. juvillacus*, Brav.).
Bravard Collection. Purchased, 1852.

27625. The atlas vertebra, wanting the alæ; from the Pleistocene of Vic-la-Conte, near Issoire (Puy-de-Dôme).
Croizet Collection. Purchased, 1848.

46097. The axis vertebra; dredged off the Eastern coast (? *E. stenonis*). *Owles Collection. Purchased*, 1874.

39288. A cervical vertebra; from the Pleistocene of Saffron Walden.
Purchased.

44072. A cervical vertebra; from the Pleistocene of the Porcupine River. *Presented by Rev. R. McDonald*, 1873.

18821. Anterior portion of the sacrum; from the Pleistocene of the Thames Valley. *Purchased*, 1845.

45303. Anterior portion of the sacrum; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

46100. The greater part of the sacrum; dredged off the Eastern coast (? *E. stenonis*).
Owles Collection. Purchased, 1874.

Equus curvidens, Owen[1].

Syn. *Equus affinis-caballo*, Lund[2].

In this species the relative length of the anterior pillar of the upper cheek-teeth is nearly the same as in *E. caballus*, but the crowns are more or less curved; they are usually as wide as or rather wider than long, and the plication of the enamel is comparatively slight[3].

Hab. South America[4].

18917. Five upper cheek-teeth; from the caverns of Minas Geraes, Brazil. *Claussen Collection. Purchased*, 1845.

18918. Five lower cheek-teeth; from the caverns of Minas Geraes.
Claussen Collection. Purchased, 1845.

[1] Cat. Foss. Mamm. Mus. R. Coll. Surg. p. 236 (1845).
[2] K. Danske Vid. Selsk. Skr. vol. xii. p. 86 (1846).
[3] See Cope, Proc. Amer. Phil. Soc. vol. xxii. p. 10 (1884).
[4] Leidy (Proc. Ac. Nat. Sci. Philad. for 1847, p. 263) recorded this species from N. America, but it is probable that the specimens so named belong to one of the species peculiar to that country.

Equus, sp. *a*.

The following specimens probably belong either to *E. major*, De Kay [1], or *E. occidentalis*, Leidy [2]. Both these species have large upper teeth, with the crowns slightly curved, and long anterior "pillars"; the latter species being distinguished by the smaller degree of the plications of the enamel-folds [3]. Leidy states [4] that it is frequently almost or quite impossible to specifically determine isolated teeth.

Hab. North America.

40846. A left upper cheek-tooth; from the (marine) Pleistocene of Newbern, North Carolina, U.S.A.
Presented by C. Falconer, Esq., 1867.

10538–9. Two lower cheek-teeth; from the Pleistocene of North Carolina. *Mantell Collection. Purchased*, 1836.

7914. A proximal phalangeal; from the Pleistocene of "Big-Bone-Lick," Kentucky, U.S.A.
Mantell Collection. Purchased, 1836.

The following specimens are not specifically determined:—

A. *From the English Upper Tertiary or Post-tertiary. These specimens indicate an animal considerably larger than any of those to which the bones referred to* E. caballus *or* E. stenonis *belonged.*

46099. The left radius, wanting a portion of the proximal articulation; dredged off the Eastern coast.
Owles Collection. Purchased, 1874.

33502. The left third metatarsal; from the Norwich Crag (Upper Pliocene) of Norfolk.
Wigham Collection. Purchased, 1859.

33503. The distal extremity of a third metapodial; from the Norwich Crag. *Wigham Collection. Purchased*, 1859.

M. 2703. The distal two thirds of a third metapodial; from the Norwich Crag. *Presented by Dr. H. Woodward*, 1857.

[1] Nat. Hist. New York—Zool. p. 108 (1842).
[2] Proc. Ac. Nat. Sci. Philad. for 1865, p. 94.
[3] See Cope, Proc. Amer. Phil. Soc. vol. xxii. p. 11 (1884).
[4] Extinct Vert. Fauna Western Territories (Rep. U.S. Geol. Geogr. Surv.), p. 242 (1873).

M. 2704. (*Fig.*) A right upper cheek-tooth, with the upper end cut and polished; from the Red Crag of Bawdsey, Suffolk. Described and figured by Owen in the Quart. Journ. Geol. Soc. vol. xii. p. 233, fig. 12, where it is provisionally referred to *E. plicidens*. The form of the anterior "pillar" is like that of *E. caballus* and unlike that of *E. stenonis*; it is not impossible that the specimen belongs to the former species.
Presented by Sir C. Lyell, Bart.

B. *From the Siwaliks of the Irawadi Valley*[1], *Burma: this and the next specimens may belong to* Hipparion.

7523. (*Fig.*) The symphysis of the mandible, with the crowns of the teeth broken off. Figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. lxxxii. fig. 12.
Mantell Collection. Purchased, 1836.

C. *From the Upper Pliocene* (?) *of Húndes in Western Tibet*[2], *and brought by traders over the Niti Pass.*

M. 2695. (*Fig.*) The proximal extremity of the left radius. Figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. lxxxiv. fig. 16.
Cautley Collection. Presented, 1842.

M. 2696. (*Fig.*) The left magnum. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiv. fig 18.
Cautley Collection. Presented, 1842.

M. 2697. (*Fig.*) The left astragalus. Figured by Falconer and Cautley, *op. cit.* pl. lxxxiv. fig. 17.
Cautley Collection. Presented, 1842.

Family RHINOCEROTIDÆ.

Including *Hyracodontidæ*.

The upper premolars are nearly or quite as complex as the true molars; the lower cheek-teeth are more or less completely crescentoid; the height of the cheek-teeth varies considerably, the crowns being

[1] In Mantell's Catalogue (MS.) this specimen is said to be from the Himalaya, but it is figured by Falconer and Cautley as from Burma.

[2] See Lydekker, Rec. Geol. Surv. Ind. vol. xiv. pp. 178–184 (1881). These beds are here provisionally classed as Pleistocene, but the writer now thinks they are more probably of Upper Pliocene age.

tallest in *Elasmotherium*. One or more dermal horns may be attached to the fronto-nasal region. The digits on the pes are apparently always three, but they may be either three or four in the manus.

Genus **RHINOCEROS**, Linn.[1]

Including[2]:—*Aceratherium*, Kaup[3].
Atelodus, Pomel[4].
Ceratorhinus, Gray[5].
Diceratherium, Marsh[6].
Zalabis, Cope[7].
Aphelops, Cope[8].
Peraceras, Cope[9].
Cœnopus, Cope[10].

Following Flower's[11] arrangement of the living Rhinoceroses in a single genus, there seems no good reason for excluding the hornless forms[12], in some of which the number of digits in the manus is four, and in others three; canines and incisors, as in the horned forms, vary in number[13].

Dentition:—I. $\frac{(0-2)}{(0-1)}$, C. $\frac{0}{(0-1)}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$. In the adult the first premolar may be absent in both jaws; pm. 1 is sometimes a true *dent de remplacement*[14]. The upper cheek-teeth[15] have two transverse

[1] Syst. Nat. ed. 12, vol. i. p. 104 (1766).

[2] For the numerous genera adopted by Cope, see Proc. Amer. Phil. Soc. vol. xix. p. 393 (1881).

[3] Isis, 1832, p. 904.

[4] Ann. Soc. Lit. Auvergne, vol. xxvi. p. 114 (1853).

[5] Proc. Zool. Soc. 1867, p. 1006.

[6] Amer. Journ. ser. 3, vol. ix. p. 242 (1875).

[7] Amer. Nat. vol. xiii. p. 771*b* (1879). (Founded on an error.)

[8] Ann. Rep. Chief of Engineers, vol. ii. p. 991 (1875). Also occurs in privately published Palæont. Bull. No. 14, p. 1 (1873).

[9] Amer. Nat. vol. xiv. p. 540 (1880).

[10] Amer. Nat. vol. xiv. p. 611 (1880).

[11] Cat. Vert. Anim. Mus. R. Coll. Surgeons, part ii., Mammalia, pp. 415–432 (1884).

[12] The female of *R. sondaicus* (the so-called *R. inermis* of Lesson) appears to be hornless in some instances. The genus *Aceratherium* was retained for the fossil forms by the writer in the 'Palæontologia Indica,' ser. 10, vol. iii., and in his 'Catalogue of Siwalik Vertebrata in Indian Museum,' part i. (1885), *Calcutta*.

[13] The outermost lower cutting-tooth is here reckoned as a canine.

[14] See a paper by the present writer in the Journ. As. Soc. Beng. vol. xlix. pt. 2, p. 135, pl. vii. (1880).

[15] For the explanation of the terms employed in describing the upper cheek-teeth of this family, see woodcut on page 116, and 'Palæontologia Indica,' ser. 10, vol. ii. p. 8.

crests, and an outer wall with open valleys; they may or may not have a "combing-plate" and a buttress at the antero-external angle; their crowns vary in height, but are never very tall. The hinder premolars are as complex as the true molars; the lower cheek-teeth are distinctly crescentoid, and there is no third lobe to $\overline{m.\ 3}$.

A. *Atelodine group.*

Two fronto-nasal horns are present; all the cutting-teeth, with the occasional exception of the lower incisor, are absent in the adult, and the upper true molars not unfrequently lack a buttress. The manus has three digits. The group is more specialized than any of the others.

Rhinoceros antiquitatis, Blumenbach [1].

Syn. *Rhinoceros tichorhinus,* Fischer [2].
Rhinoceros pallasi, Desmarest [3].
Rhinoceros jourdani, Lortet and Chantre [4].

The nasal septum is fully ossified and of great stoutness; the upper true molars have no buttress, but all the upper cheek-teeth have a large "combing-plate" and three fossettes on the worn crowns, of which the plane of wear is nearly horizontal; there is usually no distinct cingulum on their anterior surfaces, and the enamel is very rugose. The crowns of the lower cheek-teeth are worn nearly horizontally.

Hab. Europe and Northern Asia (Pleistocene).

49661. Cast of the skull of an immature individual. The original is from Kronberg, Bavaria. *Purchased*, 1878.

M. 2763. Cranium, wanting the palate; from the Pleistocene of Siberia. *No history.*

M. 2764. (*Fig.*) Cranium, wanting the palate; from the Pleistocene of Siberia. This specimen is figured in Owen's 'British Fossil Mammals and Birds,' p. 325, fig. 120.
No history.

[1] Handbuch der Naturgeschichte, 1st French ed. vol. ii. p. 408 (1803).
[2] Zoog. Syst. 1813, *teste* Flower.
[3] Mammalogie, p. 402 (1822).
[4] Arch. Mus. Lyon. vol. i. p. 80 (1872).

M. 2765. The cranium, wanting all the teeth except the left m. 2, which is much worn; from the Pleistocene of Siberia.
No history.

46085. The cranium of an immature individual, showing the last five cheek-teeth of the right side; dredged off the Dogger Bank. This specimen has sustained a fracture during the lifetime of its owner across the frontal region, by which its anterior region is bent considerably to one side.
Owles Collection. *Purchased*, 1874.

28561. The much damaged hinder portion of the cranium; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

120–123 (O. C.). (*Fig.*) Part of the left fronto-nasal region of the cranium together with three associated upper true molars; from the Pleistocene of Chartham, near Canterbury, Kent. These specimens were obtained by Mr. J. Somner in 1668, and were described as the remains of a sea-monster in a pamphlet entitled 'News from Chartham in Kent, &c.,'

Fig. 12.

Rhinoceros antiquitatis.—The second right upper true molar; from the Pleistocene of Chartham, Kent. ½.

London, 1669[1]. The portion of the cranium (No. 120) is described and figured in Owen's 'British Fossil Mammals and Birds,' p. 325, fig. 121; and one of the molars (No. 122) on p. 329, fig. 122 of the same work; the latter figure is reproduced in woodcut (fig. 12). *No history.*

M. 2766. The greater part of the nasals; from the Pleistocene of Siberia. This specimen has evidently been cut away from the cranium. *No history.*

14600. (*Fig.*) The middle portion of the nasals; from Kent's Cavern, Torquay, Devonshire. This specimen, which has been gnawed by Hyænas, is figured in McEnery's 'Cavern Researches,' pl. L.
McEnery Collection. Purchased, 1842.

38721–4. Five associated upper cheek-teeth, comprising m. 2 and m. 3 of both sides and the right pm. 3; from the Pleistocene of Peckham, Surrey. Noticed by Boyd-Dawkins in the Quart. Journ. Geol. Soc. vol. xxiii. p. 226 (1867).
Purchased, 1864.

47111. The last five upper cheek-teeth of both sides, in a half-worn condition; from the Pleistocene near Peterborough, Northampton. *Sharp Collection. Purchased*, 1876.

33188. The third left upper true molar; from the Pleistocene of Wellingborough, Northampton.
Presented by Sir R. Owen, K.C.B., 1857.

M. 2767. Portions of two upper cheek-teeth; from the Pleistocene of Chatham, Kent. *No history.*

45289. Portion of an upper cheek-tooth; from the Pleistocene of Ilford, Essex. *Brady Collection. Purchased*, 1878.

M. 61. Portion of a left upper cheek-tooth; from the Pleistocene of Applecake Hill, Bickly, Knighton-on-Teme, Worcestershire. *Purchased*, 1880.

M. 246. The third right upper true molar (imperfect); from the Pleistocene of Maidstone, Kent.
Enniskillen Collection. Purchased, 1882.

[1] There is a copy in the King's Library, British Museum; and it is reprinted in the Phil. Trans. for 1701, pp. 882–893, with two figures of molars.

16 (O. C.). The fourth right upper premolar; from Kirkdale Cave, Yorkshire. Figured in Owen's 'British Fossil Mammals and Birds,' p. 335, fig. 125. (*Fig.*)
Presented by W. Salmond, Esq. Before 1836.

16147, 16802, 16803. A large series of upper cheek-teeth; from Kent's Cavern. *McEnery Collection. Purchased*, 1842.

18289, 18982. A large series of upper cheek-teeth; from Kent's Cavern. *Presented by Rev. Upton Richards*, 1845.

16147 a, 16803 a. A series of upper milk-molars; from Kent's Cavern. *McEnery Collection. Purchased*, 1842.

18982 a. A number of upper milk-molars; from Kent's Cavern. *Presented by Rev. Upton Richards*, 1845.

28566. The third left upper premolar; from a cavern in Sundwig. *Purchased*, 1853.

32360. The fourth left upper premolar; from a cavern in Sundwig. *Purchased*, 1853.

21019. The fourth right upper premolar; from a cavern in Sundwig. *Purchased*, 1853.

10 (O. C.). The second right upper true molar; from the Pleistocene of Sandhofen on the Rhine.
Sömmering Collection. Purchased, 1827.

115 (O. C.). The second right upper true molar; from the Pleistocene of Eichstadt.
Sömmering Collection. Purchased, 1827.

7, 8 (O. C.). Two specimens of the second right upper true molar; from the Pleistocene of Cannstadt, near Stuttgart, Würtemberg. One of these specimens shows a strong anterior cingulum, and thereby approaches *R. platyrhinus*.
Sömmering Collection. Purchased, 1827.

9 (O. C.). The third left upper true molar; from the Pleistocene of Cannstadt. *Sömmering Collection. Purchased*, 1827.

44756. The third left upper true molar; from the Pleistocene of Rugby, Warwickshire.
Presented by B. Bright, Esq., 1873.

28562. The nearly complete mandible, showing all the teeth except $\overline{\text{pm. 1}}$; from a cavern in Sundwig. *Purchased*, 1853.

M. 2772. The greater part of the left ramus of the mandible of an immature individual, showing all the teeth except $\overline{\text{pm. 1}}$, of which there is no alveolus; from the Pleistocene of Westeregeln, near Magdeburg, Saxony.
Presented by John Brown, Esq., 1852.

33935. Part of the symphysis and left ramus of the mandible of a young individual, showing one milk-molar *in situ* and a true molar *in alveolo*; from the Pleistocene of East Wickham, Kent. *Presented by H. Edgell, Esq.*, 1859.

6 (O. C.). (*Fig.*) The second right lower true molar; found during the digging of the Regent's Canal, in the Pleistocene gravel of London. Described and figured in Owen's 'British Fossil Mammals and Birds,' p. 337, fig. 127. *No history.*

43653. A right lower true molar; from the Pleistocene fissures of Oreston, near Plymouth, Devonshire. *Purchased*, 1872.

28988. A left lower true molar; from the bed of the Thames at Battersea. *Purchased*, 1853.

16006. A slightly worn third left lower true molar; from the Pleistocene of Sutton, near Peterborough, Northamptonshire. *Purchased*, 1842.

46087. Three lower true molars provisionally referred to this species; dredged off the Dogger Bank.
Owles Collection. Purchased, 1874.

126 (O. C.). A left lower true molar; from Kirkdale Cave.
Presented by W. Salmond, Esq. Before 1836.

16151, 16737, 16745, 16749, 16804. A large series of lower cheek-teeth; from Kent's Cavern.
McEnery Collection. Purchased, 1842.

18288, 18788, 18982 b. A large series of lower cheek-teeth; from Kent's Cavern. *Presented by Rev. Upton Richards*, 1845.

28566. Three lower cheek-teeth; from a cavern in Sundwig.
Purchased, 1853.

44076. The nearly complete right scapula; from the Pleistocene of Clapton, Middlesex.
Presented by W. M. Cooke, Esq., M.D., 1873.

M. 2768. The posterior part of the glenoidal half of the right scapula; from Kent's Cavern.
McEnery Collection. Purchased, 1842.

28565. The imperfect glenoidal halves of the right and left scapulæ; from a cavern in Sundwig. *Purchased*, 1853.

46089. The left humerus, imperfect proximally; dredged off the Dogger Bank. *Owles Collection. Purchased*, 1874.

16850. The distal two thirds of the left humerus; from Kent's Cavern. *McEnery Collection. Purchased*, 1842.

18982. The imperfect distal two thirds of the left humerus; from Kent's Cavern. *Presented by Rev. Upton Richards*, 1845.

16850 b. The middle portion of the left humerus; from Kent's Cavern. *McEnery Collection. Purchased*, 1842.

16850 c. The middle portion of the left humerus; from Kent's Cavern. *McEnery Collection. Purchased*, 1842.

18304. The shaft of the left humerus of a very young individual; from Kent's Cavern.
Presented by Rev. Upton Richards, 1845.

M. 402. The shaft of the left humerus of an immature individual, provisionally referred to this species; from the Pleistocene of Maidstone, Kent.
Egerton Collection. Purchased, 1882.

42044–5. Two specimens of the imperfect distal half of the right humerus; from the Pleistocene of Doward Wood, Herefordshire. *Presented by Hon. K. Howard*, 1870.

28563. The right radius and ulna; from a cavern in Sundwig.
Purchased, 1853.

18982. The proximal half of the right radius; from Kent's Cavern.
McEnery Collection. Purchased, 1842.

36772. Part of the proximal half of a right ulna, provisionally referred to this species; from the Pleistocene of Peckham.
Purchased, 1862.

44742. The proximal two thirds of the left radius; from the Pleistocene of Bath-Easton, Somersetshire.
Presented by B. Bright, Esq., 1873.

46090. A left radius, provisionally referred to this species; dredged off the Dogger Bank.
Owles Collection. Purchased, 1874.

46091. A right radius, provisionally referred to this species; dredged off the Dogger Bank.
Owles Collection. Purchased, 1874.

16835. The left third metacarpal; from Kent's Cavern.
McEnery Collection. Purchased, 1842.

28567. The right third metacarpal; from a cavern in Sundwig.
Purchased, 1853.

46093. The greater part of the left innominate; dredged off the Dogger Bank. *Owles Collection. Purchased*, 1874.

44077. The left femur; from the Pleistocene of Clapton. Associated with No. 44076.
Presented by W. M. Cooke, Esq., M.D., 1873.

46092. The shaft of the left femur; dredged off the Eastern coast of England. *Owles Collection. Purchased*, 1874.

36773. The middle portion of a left femur, associated with No. 36772, and provisionally referred to this species; from the Pleistocene of Peckham. *Purchased*, 1862.

44080. The right patella; from the Pleistocene of Clapton.
Presented by W. M. Cooke, Esq., M.D., 1873.

16849. The left patella; from Kent's Cavern.
McEnery Collection. Purchased, 1842.

44079. A fibula; from the Pleistocene of Clapton.
Presented by W. M. Cooke, Esq., M.D., 1873.

44078. The left tibia; from the Pleistocene of Clapton.
Presented by W. M. Cooke, Esq., M.D., 1873.

28564. Two imperfect specimens of the left tibia; from the caverns of Sundwig. *Purchased*, 1853.

16103. The distal half of the left tibia; from the Pleistocene of Cold Higham. *Purchased.*

M. 2769. The distal two thirds of the left tibia; from Kent's Cavern. *McEnery Collection. Purchased*, 1842.

M. 2770. The distal two thirds of the right tibia; from Kent's Cavern. *McEnery Collection. Purchased*, 1842.

32249. The right tibia, wanting the proximal extremity; from the Pleistocene of Erith, Kent. *Purchased*, 1856.

27987. The proximal extremity of a right tibia, provisionally referred to this species; from the Pleistocene of Clacton, Essex. *Presented by John Brown, Esq.*, 1852.

16850. The left calcaneum; from Kent's Cavern. *McEnery Collection. Purchased*, 1842.

18982 a. The right astragalus; from Kent's Cavern. *McEnery Collection. Purchased*, 1842.

28 (O. C.). The left astragalus; from Kirkdale Cave. *Presented by W. Salmond, Esq. Before* 1836.

43654. The left cuboid; from the Pleistocene fissures of Oreston. *Purchased*, 1872.

46088. An imperfect axis vertebra; dredged off the Dogger Bank. This specimen differs from the axis (No. 22025) referred to *R. leptorhinus*. *Owles Collection. Purchased*, 1874.

46122. Part of a cervical vertebra, provisionally referred to this species; dredged off the Dogger Bank. *Owles Collection. Purchased*, 1874.

33194. A sacrum, provisionally referred to this species; from Easton Cliff, Suffolk. *Purchased.*

M. 283. Several imperfect associated bones; from the Pleistocene of Lawford, near Rugby, Warwickshire. *Egerton Collection. Purchased*, 1882.

M. 445. Numerous associated bones, mostly imperfect; from the Pleistocene of Lawford. *Enniskillen Collection. Purchased*, 1882.

Rhinoceros platyrhinus, Falconer and Cautley [1].

The narial septum is unossified: the upper cheek-teeth present a great resemblance to those of *R. antiquitatis*, having a "combing-plate," a third fossette on their worn crowns, no buttress at their antero-external angle, and the plane of wear horizontal, with a moderately rugose enamel. They differ, however, from typical specimens by the presence of a strong anterior cingulum to the true

[1] Fauna Antiqua Sivalensis, pt. 7, pl. lxxii. (1847).

molars. The mandible provisionally assigned to the species was probably without cutting-teeth, although the occurrence of such teeth might be expected in this Pliocene form. The species is not improbably an ancestral form both of *R. antiquitatis* (with which it was apparently connected by an unnamed species from Maragha in North-western Persia[1]), and of the African *R. simus*. An upper molar from Algeria figured by Thomas[2] probably indicates another member of the same group.

Hab. India. All the specimens are from the Pliocene of the Siwalik Hills.

36661. (*Fig.*) The nearly complete cranium, showing the six cheek-teeth, in a comparatively early stage of wear. This specimen is described and figured (from a cast) by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 49, pls. viii., and ix. fig. 2; it was collected by Sir W. E. Baker.
Presented by the Secretary of State for India, 1860.

33662. (*Fig.*) The anterior portion of the cranium, in a much-rolled condition, and with the crowns of the teeth hammered off. Figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. lxxii. fig. 1. This and the following specimens are the types. *Cautley Collection. Presented*, 1842.

M. 2731. (*Fig.*) Hinder part of the cranium, with a fragment of the right ramus of the mandible attached. Figured by Falconer and Cautley, *op. cit.* pl. lxxii. fig. 2.
Cautley Collection. Presented, 1842.

39641. (*Fig.*) The second right upper true molar, in a broken condition. Figured by Falconer and Cautley, *op. cit.* pls. lxxii. fig. 6, and lxxv. fig. 11. *Cautley Collection. Presented*, 1842.

39640. (*Fig.*) The third right upper true molar. Figured by Falconer and Cautley, *op. cit.* pl. lxxii. fig. 7, and lxxv. fig. 12.
Cautley Collection. Presented, 1842.

17996. (*Fig.*) Anterior portion of a mandible, provisionally referred to this species, showing the last three premolars and the first two true molars. Figured by Falconer and Cautley, *op. cit.* pl. lxxiv. fig. 6, under the name of *R. sivalensis*. The reasons for provisionally assigning this specimen to the present species are given by the present writer in the

[1] See a paper by the writer on the Fossil Mammalia of Maragha in the Quart. Journ. Geol. Soc. vol. xlii. (1886).

[2] Mém. Soc. Géol. France, sér. 3, vol. iii. art. 2, pl. x. (iv.) fig. 3 (1884).

'Palæontologia Indica,' ser. 10, vol. ii. pp. 37–39; if this reference be correct, the specimen indicates a much smaller individual than those noticed above. The mandible agrees with the cranium in the narrowness of the interval between the two lines of teeth. The symphysis is broken, but there are no traces of the alveoli of canines; the form of the symphysis and its relation to the premolars are more like those obtaining in *R. simus* and *R. bicornis* than in any other existing species.

Cautley Collection. Presented, 1842.

Rhinoceros leptorhinus (Owen[1]).

Syn. (?) *Atelodus aymardi*, Pomel[2] (*teste* Boyd-Dawkins).
Rhinoceros hemitæchus, Falconer[3].
Rhinoceros mesotropus, Aymard[4] (*in parte*) (*teste* Falconer).
(?) *Rhinoceros lunelensis*, Gervais[5].

Cuvier's name of *R. leptorhinus* being inadmissible for the next species, and *R.* (*A.*) *aymardi* and *R. mesotropus* being uncertain, while *R. hemitæchus* is of later date, Owen's name is adopted for the present species[6].

The occiput is narrowest superiorly, and extends but little backwards: the narial septum, at least in some instances, is fully ossified. In the upper true molars there is a buttress but generally no "combing plate," so that there are usually but two fossettes on the worn crowns; sometimes, however, a "combing-plate" is present, and there are then three fossettes; in the upper premolars a "combing-plate" is less unfrequent; there is a concavity at the base of the outer surface

[1] British Fossil Mammals and Birds, p. 356 (1846).

[2] Catalogue Méthodique, p. 80 (1853).

[3] Quart. Journ. Geol. Soc. vol. xvi. p. 488 (1860).

[4] In Pictet's 'Paléontologie,' 2nd ed. vol. i. p. 298 (1853). The *R. velaunus*, Aymard, identified by Gervais (Zool. et Pal. Françaises, 2nd ed. p. 90) with this form, is of Lower Miocene age, *vide* Filhol, Ann. Sci. Géol. vol. xii. art. 3, p. 75.

[5] Zool. et Pal. Françaises, 1st ed. vol. i. p. 48 (1848–52). In the second edition Gervais identified this form with *R. tichorhinus*.

[6] Owen (British Fossil Mammals and Birds, p. 356) identified Jäger's *R. kirchbergensis* and *R. mercki* with his *R. leptorhinus*; and Falconer in one part of his memoir on *R. hemitæchus* (Palæontological Memoirs, vol. ii. p. 321) had some doubts whether this might not be partially correct: in other passages, however (*loc. cit.* pp. 309, 398), he identifies the German form with *R. megarhinus*; the latter view is adopted by Boyd-Dawkins in the Quart. Journ. Geol, Soc. vol. xxiii. p. 214 (1867). In the 'Palæontologia Indica,' ser. 10, vol. ii. p. 6 the present writer followed Owen's identification, which is also followed by Brandt.

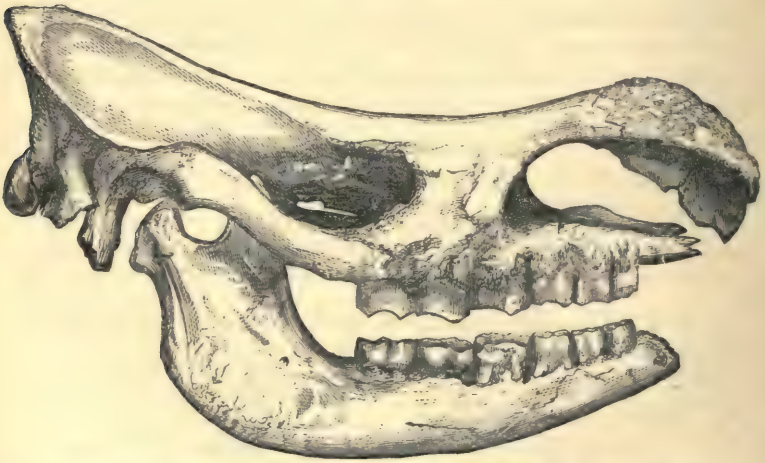
of the upper true molars. The enamel is moderately rugose, and the crowns of the upper cheek-teeth are worn into hollows; there are usually three costæ on the outer surfaces of the upper hinder premolars. The lower cheek-teeth are characterized by the obliquity of their plane of wear, the moderate rugosity of the enamel, and the flattening of the outer surface of the first crescent. The limb-bones are of a more slender type than those of *R. antiquitatis*.

Hab. Europe. Pleistocene; according to Boyd-Dawkins[1] it does not occur in the Forest-bed of the Eastern coast of England.

27836. (*Fig.*) The cranium, wanting the whole of the palato-maxillary region; from the Pleistocene of Clacton, Essex. This specimen is Owen's type, and is described and figured by him in the 'British Fossil Mammals and Birds,' p. 356, fig. 131, p. 367, fig. 138, p. 368, fig. 139, and p. 369, fig. 140; it is also figured in 'Falconer's Palæontological Memoirs,' vol. ii. pl. xv., under the name of *R. hemitœchus*.
Presented by John Brown, Esq., 1852.

45205. (*Fig.*) The cranium; from the Pleistocene of Ilford, Essex. This specimen (fig. 13) is figured in the Geol. Mag. dec. 2,

Fig. 13.



Rhinoceros leptorhinus.—Skull; from the Pleistocene Brick-earth of the Thames Valley at Ilford, Essex. About ¼.

[1] Quart. Journ. Geol. Soc. vol. xxxvi. p. 396 (1880).

vol. i. pl. xv. When found the narial septum was complete; the whole of the cheek-dentition, with the exception of pm. 1, is exhibited on both sides, and is in a half-worn condition. *Brady Collection. Purchased*, 1878.

45206. The cranium, wanting the premaxillæ and the whole of the palatal region; from the Pleistocene of Ilford. The anterior and posterior moieties of the narial septum are preserved. *Brady Collection. Purchased*, 1878.

20013. (*Fig.*) The hinder half of the cranium; from the Pleistocene of Northampton. This specimen is described and figured in 'Falconer's Palæontological Memoirs,' vol. ii. p. 351, pls. xxiii. fig. 1, and xxiv. fig. 1, under the name of *R. hemitœchus*. *Purchased*, 1846.

48953. (*Fig.*) The hinder half of the cranium; from Minchin Cave, Gower, Glamorganshire. This specimen is described and figured in 'Falconer's Palæontological Memoirs,' vol. ii. p. 351, pls. xxiii. fig. 2, and xxiv. figs. 2, 3, under the name of *R. hemitœchus*. *Presented by Gen. E. R. Wood*, 1868.

40946. (*Fig.*) Part of the right maxilla, showing the last five cheek-teeth (m. 1 imperfect); from Minchin Cave. Described and figured in 'Falconer's Palæontological Memoirs,' vol. ii. p. 323, pl. xvi. fig. 1, as *R. hemitœchus*. The third costa in pm. 4 is well exhibited.

Presented by Gen. E. R. Wood, 1868.

40938. (*Fig.*) The last four upper cheek-teeth of the right side, in a much-worn condition; from Minchin Cave. Figured in 'Falconer's Palæontological Memoirs,' vol. ii. pl. xvi. fig. 2, as *R. hemitœchus*. *Presented by Gen. E. R. Wood*, 1868.

40930. The last six upper cheek-teeth, in a well-worn condition; from Minchin Cave.

Presented by Gen. E. R. Wood, 1868.

37404. The associated upper cheek-teeth of both sides, wanting m. 1 on the right and pm. 1 on both sides; from the Pleistocene of Lexden, near Colchester, Essex. The third costa is shown in pm. 3 and pm. 4, and there is a large tubercle at the entrance of the median valley of m , as in No. 40930. Noticed by Boyd-Dawkins in the Quart. Journ. Geol. Soc. vol. xxiii. p. 219.

Brown Collection. Presented by Sir R. Owen, K.C.B., 1859.

40940. The second left upper true molar; from Minchin Cave. (*Fig.*) Figured in 'Falconer's Palæontological Memoirs,' vol. ii. pl. xvi. fig. 3, as *R. hemitæchus*.
Presented by Gen. E. R. Wood, 1868.

40941. The third left upper true molar; from Minchin Cave. (*Fig.*) Figured in 'Falconer's Palæontological Memoirs,' vol. ii. pl. xvii. figs. 3, 4, 5, as *R. hemitæchus*.
Presented by Gen. E. R. Wood, 1868.

124 (O. C.). A much-worn first right upper true molar; from Kirkdale Cave, Yorkshire.
Presented by W. Salmond, Esq. Before 1836.

27838. The second right upper true molar; from the Pleistocene of (*Fig.*) Clacton. Described and figured in Owen's 'British Fossil Mammals and Birds,' p. 373, fig. 143.
Presented by John Brown, Esq., 1852.

27839. The second left upper true molar; from the Pleistocene of Clacton. *Presented by John Brown, Esq.*, 1852.

27840. Fragment of the left maxilla, containing the imperfect m. 3; from the Pleistocene of Clacton. Noticed in Owen's 'British Fossil Mammals and Birds,' p. 372.
Presented by John Brown, Esq., 1852.

45207. The third right upper true molar; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

45209. The second left upper true molar, in a half-worn condition; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

45212. The second right upper true molar, in an almost unworn condition; from the Pleistocene of Ilford. There is a "combing-plate" low down in the median valley.
Brady Collection. Purchased, 1878.

40482. The third left upper true molar, in a half-worn condition; from the Pleistocene of Ilford. *Purchased*, 1876.

18792, 18793, 18795. Three well-worn first or second upper true molars; from the Pleistocene of Grays, Essex. Two of these specimens possess a "combing-plate," and (consequently) a third fossette. *Purchased*, 1845.

18796. The well-worn fourth left upper premolar; from the Pleistocene of Grays. *Purchased*, 1845.

20810. The well-worn fourth right upper premolar; from the Pleistocene of Grays. *Purchased*, 1847.

18755 c. The fourth left upper premolar; from the Pleistocene of Grays. *Purchased*, 1845.

18795 a. The second right upper true molar; from the Pleistocene of the Thames Valley. *Purchased*, 1845.

36770. (*Fig.*) The little-worn first or second right upper true molar; from the Pleistocene of Peckham, Surrey. Figured by Boyd-Dawkins in the Quart. Journ. Geol. Soc. vol. xxiii. pl. x. fig. 5 (1867). *Purchased*, 1862.

36771. The fourth right upper premolar, in an unworn condition; from the Pleistocene of Peckham. *Purchased*, 1862.

47647. (*Fig.*) The fourth right upper premolar; from a cavern in Windmill Hill, Gibraltar. Figured by Busk in the Trans. Zool. Soc. vol. x. pl. x. figs. 1–3, under the name of *R. hemitœchus*. The third costa is very strongly developed.
Brome Collection. Presented, 1876.

47647 a. (*Fig.*) The second or third right upper true molar, in a middle stage of wear. Figured by Busk, *op. cit.* pl. x. figs. 4, 5, 7, as *R. hemitœchus*. *Brome Collection. Presented*, 1876.

47647 b. (*Fig.*) An imperfect first or second left upper true molar; from a cavern in Windmill Hill. Figured by Busk, *op. cit.* pl. x. fig. 6, as *R. hemitœchus*.
Brome Collection. Presented, 1876.

45211. The inner half of a right upper premolar; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

18755 p. The first right upper milk-molar; from the Pleistocene of Grays. This specimen agrees with the one figured in 'Falconer's Palæontological Memoirs,' vol. ii. pl. xxv. fig. 3, under the name of *R. hemitœchus*.
Purchased, 1845.

40806. Cast of part of a left maxilla, showing the first three milk-molars, provisionally referred to this species. The original is from the cavern of Lunel-Viel (Hérault), France, and is the type of Gervais's *R. lunelensis*. The teeth very closely resemble those of a specimen of the present species figured

in 'Falconer's Palæontological Memoirs,' vol. ii. pl. xxi. fig. 3, under the name of *R. hemitœchus*.

Presented by C. Falconer, Esq., 1867.

M. 2518. Numerous upper cheek-teeth; from the Pleistocene of Barrington, Cambridgeshire. *Purchased*, 1885.

45214. (*Fig.*) The nearly complete mandible, showing the normal six cheek-teeth of either side, except the left $\overline{\text{pm. 2}}$; from the Pleistocene of Ilford. There are two mentary foramina. This specimen is figured in the woodcut on page 102.

Brady Collection. Purchased, 1878.

45215. Considerable portion of the mandible, showing the symphysis, the normal three premolars, and the left $\overline{\text{m. 3}}$; from the Pleistocene of Ilford.

Brady Collection. Purchased, 1878.

45216. Fragment of the right ramus of the mandible with $\overline{\text{m. 3}}$; from the Pleistocene of Ilford.

Brady Collection. Purchased, 1878.

45288. The symphysis and the greater part of the right ramus of a mandible, provisionally referred to the present species; from the Pleistocene of Ilford. The teeth are all wanting; and the specimen was referred by Falconer in MS. to *R. antiquitatis*, but it is more probable that it belongs to the present species.

Brady Collection. Purchased, 1878.

40942. (*Fig.*) Part of the left ramus of the mandible, containing the last five cheek-teeth; from Minchin Cave. Figured in 'Falconer's Palæontological Memoirs,' vol. ii. pl. xx., under the name of *R. hemitœchus*.

Presented by Gen. E. R. Wood, 1868.

40943. Part of the right ramus of the mandible, showing $\overline{\text{pm. 3}}$, $\overline{\text{pm. 4}}$, $\overline{\text{m. 1}}$, and $\overline{\text{m. 2}}$; from Minchin Cave.

Presented by Gen. E. R. Wood, 1868.

40944. The hinder part of the left ramus of the mandible, showing the three true molars; from a cave at Gower.

Presented by Gen. E. R. Wood, 1868.

40945. Part of the symphysis and the right ramus of the mandible, with the normal three premolars; from a cave at Gower.

Presented by Gen. E. R. Wood, 1868.

37405. The last five lower cheek-teeth of the right side; from the Pleistocene of Lexden.
Brown Collection. Presented by Sir R. Owen, K.C.B., 1859.

37406. Part of the left ramus of the mandible, containing pm. 3, pm. 4, m. 2, and m. 3; from the Pleistocene of Lexden.
Brown Collection. Presented by Sir R. Owen, K.C.B., 1859.

M. 2771. Part of the right ramus of the mandible, showing the three true molars; from the Pleistocene of Ilford.
Purchased.

27849. The symphysial half of a mandible of a young individual, without the teeth; from the Pleistocene of Grays, Essex.
Presented by John Brown, Esq., 1852.

27841. (*Fig.*) Part of the symphysis and the left ramus of the mandible, showing the three premolars; from the Pleistocene of Clacton. Described and figured in Owen's 'British Fossil Mammals and Birds,' p. 363, fig. 135.
Presented by John Brown, Esq., 1852.

27843. Part of the symphysis and left ramus of the mandible, showing pm. 4; from the Pleistocene of Clacton.
Presented by John Brown, Esq., 1852.

27837. (*Fig.*) Part of the symphysis and the right ramus of a mandible, provisionally referred to this species; from the Pleistocene of Clacton. This specimen, which shows m. 2 and m. 3 and the alveoli of the anterior teeth, is figured in Owen's 'British Fossil Mammals and Birds,' p. 361, fig. 133; it is of large size, but agrees with the present species in the extension of the symphysis as far back as pm. 3.
Presented by John Brown, Esq., 1852.

27842. (*Fig.*) Part of the left ramus of a mandible, provisionally referred to this species, containing pm. 4, m. 1, and m. 2; from the Pleistocene of Walton. Figured in Owen's 'British Fossil Mammals and Birds,' p. 362, fig. 134.
Presented by John Brown, Esq., 1852.

45221, 45224. Two lower cheek-teeth; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

M. 2519. Numerous lower cheek-teeth; from the Pleistocene of Barrington, Cambridgeshire. *Purchased*, 1885.

The following specimens belong either to this or the next species; those from Gibraltar certainly belong to R. leptorhinus, *while those from Ilford probably belong to the same, as* R. megarhinus *is rare in those deposits.*

20817. Part of the glenoidal half of the right scapula; from the Pleistocene of Ilford. *Purchased*, 1847.

47657. (*Fig.*) The proximal epiphysis of the left humerus; from a cavern in Windmill Hill, Gibraltar. Figured by Busk in the Trans. Zool. Soc. vol. x. pl. xi. fig. 1, under the name of *R. hemitœchus*. *Brome Collection. Presented*, 1876.

23111. The left humerus; from the Pleistocene of Ilford. *Purchased*, 1848.

27847. The left humerus, wanting the distal extremity; from the Pleistocene of Clacton. *Presented by John Brown, Esq.*, 1852.

20276. The left humerus, wanting the proximal extremity; from the Pleistocene of Ilford. *Purchased*, 1847.

45247. The shaft of the left humerus of an adolescent animal; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

21673. The distal extremity of the left humerus; from the Pleistocene of Grays. *Purchased*, 1847.

16853. The right humerus, wanting the proximal, and a part of the distal extremity; from the Pleistocene of Ilford. *Presented by W. Thompson, Esq.*

21275. The shaft of the right humerus; from the Pleistocene of Ilford. *Purchased*, 1847.

45248. The distal half of the right humerus; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

24968. The distal two thirds of the right humerus; from the Pleistocene of Ilford. *Purchased*, 1847.

21277. The distal third of the right humerus; from the Pleistocene of Ilford. *Purchased*, 1847.

40954. The right radius and ulna; from Minchin Cave. *Presented by Gen. E. R. Wood*, 1868.

20811. The right radius, imperfect distally; from the Pleistocene of Grays. *Purchased*, 1847.

45254. The right radius; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

45253. The left radius; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

45255. The left radius; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

47657. The left radius; from the Genista Cave, Gibraltar. Figured (*Fig.*) by Busk in the Trans. Zool. Soc. vol. x. pl. xiv. figs. 1, 2, under the name of *R. hemitœchus*. *Brome Collection. Presented*, 1876.

21300. The left radius, wanting the distal epiphysis; from the Pleistocene of Grays. *Purchased*, 1847.

21679. The left radius; from the Pleistocene of Grays. This specimen is of large size, and may very probably belong to *R. megarhinus*. *Purchased*, 1847.

23755 e, 23756. The left radius and ulna (imperfect); from the Pleistocene of Slade Green, near Erith, Kent. *Purchased*, 1848.

23755 e–1. The proximal two thirds of the left ulna; from the Pleistocene of Slade Green. *Purchased*, 1848.

49453. The proximal two thirds of the left ulna; from the Pleistocene of the Eastern coast of England. *Purchased*, 1878.

23755 e–2. The right ulna, wanting the proximal extremity; from Slade Green. *Purchased*, 1848.

27869. The greater part of the right ulna of a small individual; from the Pleistocene of Walton. *Presented by John Brown, Esq.*, 1852.

47659. The right lunar; from the Genista Cave, Gibraltar. Figured (*Fig.*) by Busk in the Trans. Zool. Soc. vol. x. pl. xv. figs. 4–8, as *R. hemitœchus*. *Brome Collection. Presented*, 1876.

22038 b. The right lunar; from the Pleistocene of Grays. *Purchased*, 1848.

45259. The left lunar; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

45260–1. Two specimens of the left magnum; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

21318 c. The left cuneiform; from the Pleistocene of Grays. *Purchased*, 1847.

23149. The left cuneiform, of smaller size; from the Pleistocene of Grays. *Purchased*, 1848.

22024 a. The right third metacarpal, of large size; from the Pleistocene of Grays. *Purchased*, 1848.

22024. The left third metacarpal, of equal size; from the Pleistocene of Grays. It is probable that this and the last specimen belong to *R. megarhinus*. *Purchased*, 1848.

45265. The left third metacarpal; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

27846. The left third metacarpal; from the Pleistocene of Clacton. *Presented by John Brown, Esq.*, 1852.

18803 a. The first phalangeal of a third digit; from the Pleistocene of the Thames Valley. *Purchased*, 1845.

21318. The second phalangeal of a third digit; from the Pleistocene of Grays. *Purchased*, 1847.

19842. The first phalangeal of a lateral digit; from the Pleistocene of Essex. *Purchased*, 1845.

47663. (*Fig.*) The second phalangeal of a lateral digit; from a cave in Windmill Hill, Gibraltar. Figured by Busk in the Trans. Zool. Soc. vol. x. pl. xv. fig. 9, under the name of *R. hemitæchus*. *Brome Collection. Presented*, 1876.

28028. (*Fig.*) The terminal phalangeal of a third digit; from the Pleistocene of Grays. Described and figured in Owen's 'British Fossil Mammals and Birds,' p. 348, fig. 129. *Presented by John Brown, Esq.*, 1852.

45280. The terminal phalangeal of a lateral digit; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

18819. The terminal phalangeal of a lateral digit; from the Pleistocene of the Thames Valley. *Purchased*, 1845.

45266. The left femur; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

47642. The distal epiphyses of the left femur; from the Genista (*Fig.*) Cave, Gibraltar. Figured by Busk in the Trans. Zool. Soc. vol. x. pl. ix. fig. 2, and referred to *Equus caballus*.
Brome Collection. Presented, 1876.

47654. The proximal portion of the right femur; from a cavern in (*Fig.*) Windmill Hill, Gibraltar. Figured by Busk in the Trans. Zool. Soc. vol. x. pls. xii., xiii., under the name of *R. hemitæchus*. *Brome Collection. Presented*, 1876.

21285. The distal half of the right femur; from the Pleistocene of Ilford. *Purchased*, 1847.

45276. The distal portion of the right femur; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

45268. The right tibia; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

21284 a. The right tibia and distal end of fibula; from the Pleistocene of Ilford. *Purchased*, 1847.

21284 b. The imperfect right tibia; from the Pleistocene of Ilford.
Purchased, 1847.

21284 c. The right tibia; from the Pleistocene of Ilford.
Purchased, 1847.

38570. The right tibia; from the Pleistocene of Ilford.
Purchased, 1864.

47656. The right tibia; from a cavern in Windmill Hill, Gibraltar. (*Fig.*) Figured by Busk in the Trans. Zool. Soc. vol. x. pl. xiv. fig. 4, under the name of *R. hemitæchus*.
Brome Collection. Presented, 1876.

45269. The left tibia; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

27976. The left tibia; from the Pleistocene of Ilford.
Presented by John Brown, Esq., 1852.

45270. The distal end of the left tibia; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

18801. The right calcaneum; from the Pleistocene of the Thames Valley. *Purchased*, 1845.

21279. The right calcaneum; from the Pleistocene of Grays.
Purchased, 1847.

M. 1590. The right calcaneum; from the Pleistocene of Weimar. This specimen almost certainly belongs to *R. megarhinus*, as it was associated with the upper molar of that species, No. M. 1585. *Presented by C. Westendarp, Esq.*, 1884.

45272. The left calcaneum; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

22019. The left calcaneum; from the Pleistocene of Ilford. *Purchased*, 1848.

20814. The left calcaneum; from the Pleistocene of Grays. *Purchased*, 1847.

21617. The right astragalus; from the Pleistocene of Grays. *Purchased*, 1847.

21278 c. The right astragalus; from the Pleistocene of Ilford. *Purchased*, 1847.

47661. The right astragalus; from the Genista Cave, Gibraltar. (*Fig.*) Figured by Busk in the Trans. Zool. Soc. vol. x. pl. xv. figs. 1–3, under the name of *R. hemitœchus*. *Brome Collection. Purchased*, 1876.

21278 d. The left astragalus; from the Pleistocene of Ilford. *Purchased*, 1847.

21278 a. The left astragalus; from the Pleistocene of Ilford. *Purchased*, 1847.

20815. The left astragalus; from the Pleistocene of Ilford. *Purchased*, 1847.

22019 a. The left astragalus; from the Pleistocene of Ilford. *Purchased*, 1848.

21294. The left navicular, of small size; from the Pleistocene of Grays. *Purchased*, 1847.

23713 e. The left navicular, of large size; from the Pleistocene of Slade Green. *Purchased*, 1849.

21318 a, b. The right and left cuboid; from the Pleistocene of Grays. *Purchased*, 1847.

18802 a. The right ectocuneiform; from the Pleistocene of the Thames Valley. *Purchased*, 1845.

20277. The left entocuneiform; from the Pleistocene of Grays. *Purchased*, 1847.

23761 g–1. The right second metatarsal, of large size; from the Pleistocene of Grays. *Purchased*, 1849.

20816 b. The left second metatarsal; from the Pleistocene of Grays. *Purchased*, 1847.

23761 g. The right third metatarsal; from the Pleistocene of Grays. This and the next specimen are of very large size. *Purchased*, 1849.

19842. The right third metatarsal; from the Pleistocene of Clacton. *Presented by John Brown, Esq.*, 1852.

20245. The right third metatarsal; from the Pleistocene of Ilford. *Purchased*, 1847.

21294 x. The right third metatarsal; from the Pleistocene of Grays. *Purchased*, 1847.

45276. The left third metatarsal; from the Pleistocene of Ilford. *Brady Collection. Purchased*, 1878.

47662. (*Fig.*) The third and the proximal portion of the fourth metatarsal of the right side; from the Genista Cave, Gibraltar. Figured by Busk in the Trans. Zool. Soc. vol. x. pl. xvi. *Brome Collection. Presented*, 1876.

47766 a. (*Fig.*) The proximal half of the third and the complete fourth metatarsal of the right side; from a cavern in Windmill Hill, Gibraltar. The former is figured by Busk in the Trans. Zool. Soc. vol. x. pl. xvii. figs. 1–4, as *R. hemitœchus*. *Brome Collection. Presented*, 1876.

23761 g–2. The fourth right metatarsal, of large size; from the Pleistocene of Grays. *Purchased*, 1849.

19834 a. The fourth right metatarsal, of smaller size; from the Pleistocene of Grays. *Purchased*, 1845.

47650. (*Fig.*) Two portions of the atlas vertebra; from the Genista Cave, Gibraltar. Figured by Busk in the Trans. Zool. Soc. vol. x. pl. xviii. figs. 1, 2, under the name of *R. hemitœchus*. *Brome Collection. Presented*, 1876.

42076. The imperfect atlas vertebra; from the Pleistocene of Ilford. *Purchased*, 1864.

M. 2520. Two specimens of the atlas vertebra; from the Pleistocene of Barrington. *Purchased*, 1885.

22025. The axis vertebra; from the Pleistocene of the Thames Valley (? Grays). *Purchased*, 1847.

21662. The axis vertebra (imperfect); from the Pleistocene of Ilford. *Purchased*, 1847.

39259. The centrum of the axis vertebra; from the Pleistocene of Grays. *Presented by E. Charlesworth, Esq.*, 1865.

27972. The centrum and part of the arch of the axis vertebra; from the Pleistocene of Clacton.
Presented by John Brown, Esq., 1852.

21275 e. A middle cervical vertebra; from the Pleistocene of Ilford. *Purchased*, 1847.

23143 b. A middle cervical vertebra; from the Pleistocene of Ilford. *Purchased*, 1849.

45239. A middle cervical vertebra; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

23143 a. The sixth cervical vertebra; from the Pleistocene of Ilford. *Purchased*, 1849.

21664. The seventh cervical vertebra (imperfect); from the Pleistocene of Grays. *Purchased*, 1847.

45240. The centrum of the seventh cervical vertebra; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

45241. The centrum of the first dorsal vertebra, associated with the preceding specimen; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

20272 a. A dorsal vertebra, with the neural spine imperfect; from the Pleistocene of Grays. *Purchased*, 1847.

Rhinoceros megarhinus, Christol [1].

Syn. (?) *Rhinoceros leptorhinus*, Cuvier [2] (*in parte*).
Rhinoceros monspessulanus, Blainville [3].
Rhinoceros mercki, Jäger [4].
Rhinoceros kirchbergensis, Jäger [5].

As it has been conclusively shown by Boyd-Dawkins in the

[1] Ann. Sci. Nat. sér. 2, vol. iv. p. 76 (1835).
[2] Ossemens Fossiles, 2nd ed. vol. ii. p. 93 (1822).
[3] 'Ostéographie,' genus *Rhinoceros*, p. 143 (1846).
[4] In Kaup's 'Akten der Urwelt,' p. 6 (1841), to replace *R. kirchbergensis*, but withdrawn in the 'Beiträge,' 1st ed. pt. i. p. vii (1854), as being identical with *R. leptorhinus*, Cuvier.
[5] Foss. Säugeth. Würt. p. 179 (1835–39).

Quart. Journ. Geol. Soc. vol. xxiii. p. 216, that there is no possibility of determining to what species the type specimens of Cuvier's *R. leptorhinus* really belong, Christol's name is adopted for the present species.

There is no ossification in the narial septum. The upper cheek-teeth very closely resemble those of *R. leptorhinus*, but are generally of larger size, and have a smoother enamel, with rather taller crowns. The upper true molars (fig. 9) have a rather more decided buttress, with a longer anterior cingulum; and there are only two "costæ" on the premolars. The lower cheek-teeth have the outer surface of the first crescent more rounded. Lower incisors are frequently present.

Hab. Europe (Pleistocene and Pliocene).

40834. Cast of a somewhat crushed cranium, showing the normal six cheek-teeth of either side, in a half-worn condition. The original was obtained from the Upper Pliocene of Lane-Lestang, near Moras (Drôme), France; and is preserved in the Natural History Museum at Lyons. The left dentition is figured in 'Falconer's Palæontological Memoirs,' vol. ii. pl. xxxi. fig. 2; a smaller view of the palatal aspect of the cranium being given in fig. 3 of the same plate; it is figured on a larger scale by Lortet and Chantre, in the Arch. Mus. Lyon. vol. ii. pl. xvii. (1878).
Presented by C. Falconer, Esq., 1867.

22020. (*Fig.*) The six right upper cheek-teeth; from the Pleistocene of Grays, Essex. These specimens are described and figured by Boyd-Dawkins in the Nat. Hist. Rev. for 1865, p. 409, fig. 9, and noticed in 'Falconer's Palæontological Memoirs,' vol. ii. p. 336. *Purchased*, 1847.

22021. The associated left pm. 4, m. 2, and m. 3, probably belonging to the same individual as the preceding; from the Pleistocene of Grays. *Purchased*, 1847.

18794, 19841, 19841 a, 22022. Four specimens of the second upper true molar, three belonging to the left and one to the right side; from the Pleistocene of Grays.
Purchased, 1845–47.

18755, 18797, 19841 b, 20249. Four specimens of the fourth upper premolar, three belonging to the right and one to the left side; from the Pleistocene of Grays.
Purchased, 1845–47.

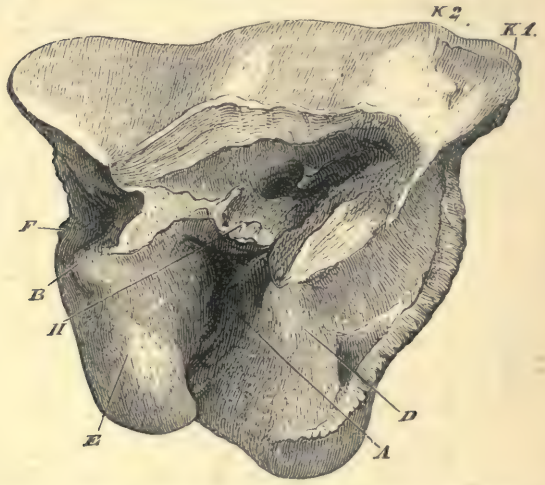
18755 g, 18796, 20810. Three specimens of the third upper premolar, two belonging to the right and one to the left side. *Purchased*, 1845–47.

18797 a. The unworn third left upper premolar; from the Pleistocene of Grays. *Purchased*, 1845.

18755 e, f. A right and left second upper premolar; from the Pleistocene of Grays. *Purchased*, 1845.

19834. (*Fig.*) The second right upper true molar; from the Pleistocene of Grays. This specimen is described and figured by Boyd-Dawkins in the Nat. Hist. Rev. for 1865, pp. 409, 410, fig. 10, the figure being reproduced in the accompanying woodcut (fig. 14). *Purchased*, 1845.

Fig. 14.



Rhinoceros megarhinus.—Second right upper true molar, slightly worn. *A*, median valley; *D*, anterior, and *E*, posterior collis; *F*, posterior valley; *H*, crotchet; K^1, K^2, first and second costæ. ½. (From the Nat. Hist Review.)

45281, 45283. A right and a left upper true molar; from the Pleistocene of Ilford, Essex.
Brady Collection. Purchased, 1878.

45282, 45284. A right and a left fourth upper premolar; from the Pleistocene of Ilford.
Brady Collection. Purchased, 1878.

36992. Cast of the third right upper true molar. The originals of this and the next specimen were obtained from the Pleistocene of Kirchberg, Würtemberg, and are the types of Jäger's *R. kirchbergensis* (=*R. merckʻi*); they are figured in 'Falconer's Palæontological Memoirs,' vol. ii. pl. xxxii. figs. 1 and 2, where they are referred to the present species.

Presented by C. Falconer, Esq., 1867.

36993. Cast of the second left upper true molar; of which the original is from the Pleistocene of Kirchberg. The history of this specimen is given with the last.

Presented by C. Falconer, Esq., 1867.

40811. A much-worn third right upper true molar, provisionally referred to the present species; from the Pleistocene (?) of Ponte Molle, Rome.

Presented by C. Falconer, Esq., 1867.

M. 1585. The second right upper true molar; from the Pleistocene of Weimar. *Presented by C. Westendarp, Esq.*, 1884.

M. 1585 a. The second left upper true molar; from the Pleistocene of Weimar. *Presented by C. Westendarp, Esq.*, 1884.

18791. (*Fig.*) The associated last three upper milk-molars of the left side; from the Pleistocene of Grays. Figured and described by Boyd-Dawkins in the Nat. Hist. Rev. for 1865, p. 405, figs. 3, 5. *Purchased*, 1845.

18755 a, b, h, 18793, 18798. Five upper milk-molars, provisionally referred to this species; from the Pleistocene of Grays. *Purchased*, 1845.

18755 k. (*Fig.*) The fourth right upper milk-molar; from the Pleistocene of Grays. Figured by Boyd-Dawkins in the Nat. Hist. Rev. for 1865, fig. 1. *Purchased*, 1845.

18755 n. (*Fig.*) The first left upper milk-molar, in an almost unworn condition; from the Pleistocene of Grays. Figured by Boyd-Dawkins in the Nat. Hist. Rev. for 1865, fig. 2.

Purchased, 1845.

27866. The third left upper true molar; from the Pleistocene of Walton-on-the-Naze, Essex.

Presented by John Brown, Esq., 1852.

40805. Cast of the symphysis and the horizontal portion of the left ramus of the mandible. The original is from the Lower

Pliocene of Montpelier (Hérault), France, and is preserved in the Museum at that town. It is noticed and figured in 'Falconer's Palæontological Memoirs,' vol. ii. p. 368, pl. xxx.; the symphysis being also figured by Gaudry in 'Les Enchaînements, &c.—Mammifères Tertiaires,' p. 32, fig. 48. The normal six cheek-teeth are present, while there is a small incisor on either side *in alveolo*. The symphysis does not extend so far back as in *R. leptorhinus* (No. 45215).

Presented by C. Falconer, Esq., 1867.

45285. The right and left rami of the mandible; from the Pleistocene of Ilford. The right ramus shows pm. 3, pm. 4, and the three true molars, the left has pm. 4 and the three true molars. This specimen agrees precisely with the last. *Brady Collection. Purchased*, 1878.

19840. (*Fig.*) Part of the right ramus of the mandible, containing the last five cheek-teeth; from the Pleistocene of Grays. Described and figured by Boyd-Dawkins in the Nat. Hist. Rev. for 1865, p. 412, figs. 14, 15. *Purchased*, 1845.

19840 a. Part of the left ramus of the mandible, with the last four cheek-teeth; from the Pleistocene of Grays.

Purchased, 1845.

40812. The associated last five lower cheek-teeth of the left side; from the Pleistocene of Grays.

Presented by C. Falconer, Esq., 1867.

15937. Part of the right ramus of the mandible of a young *Rhinoceros*, perhaps belonging to the present species; from the Pleistocene (? Forest-bed) of Norfolk. This specimen shows mm. 2, mm. 3, and the alveoli of mm. 1 and mm. 4.

Green Collection. Purchased, 1843.

18790. (*Fig.*) Part of the symphysis and the left ramus of the mandible of a young individual, showing the last three milk-molars, and the alveoli of mm. 1 and m. 1; from the Pleistocene of Grays. Described and figured by Boyd-Dawkins in the Nat. Hist. Rev. for 1865, p. 407, figs. 7, 8.

Purchased, 1845.

21280. A very similar specimen to the last, showing mm. 2 and mm. 3, and the alveoli of mm. 1 and mm. 4; from the Pleistocene of Grays. *Purchased*, 1847.

23133. Another very similar specimen, belonging to the right side, and showing the last three milk-molars, and the alveoli of $\overline{\text{mm. 1}}$ and $\overline{\text{mm. 4}}$; from the Pleistocene of Grays.
Purchased, 1849.

23112. Part of the right ramus of the mandible of a young individual provisionally referred to this species; from the Pleistocene of Grays. The last two milk-molars are *in situ*, and beneath and behind them are seen the alveoli of $\overline{\text{pm. 3}}$, $\overline{\text{pm. 4}}$, and $\overline{\text{m. 1}}$. *Purchased*, 1849.

21281. Part of the right ramus of the mandible of a very young individual, showing $\overline{\text{mm. 2}}$ and the alveoli of $\overline{\text{mm. 1}}$ and $\overline{\text{mm. 3}}$; from the Pleistocene of Grays. *Purchased*, 1847.

18799. The second right lower true molar; from the Pleistocene of Grays. *Purchased*, 1845.

M. 1586. Two left lower molars; from the Pleistocene of Weimar.
Presented by C. Westendarp, Esq., 1884.

36994. Cast of the fourth right lower premolar. The original is from the Pleistocene of Kirchberg, and belongs to Jäger's *R. kirchbergensis*. *Presented by C. Falconer, Esq.*, 1867.

18755 C. (*Fig.*) The second left lower premolar; from the Pleistocene of Grays. Figured by Boyd-Dawkins in the Nat. Hist. Rev. for 1865, fig. 4. *Purchased*, 1845.

27902. (*Fig.*) The first left lower milk-molar; from the Pleistocene of Grays. Figured by Boyd-Dawkins, *op. cit.* fig. 6.
Purchased, 1849.

A number of detached lower cheek-teeth from the Pleistocene of the Thames Valley, marked Nos. 18755, 18799, 19834, 19841, 20249, 21283, 22023, *belong either to this or the preceding species.*

Rhinoceros etruscus, Falconer[1].

Syn. *Rhinoceros elatus*, Croizet (? MS.).

The ossification of the narial septum is incomplete. The upper cheek-teeth have shorter crowns than those of either of the three preceding European species, and a very stout cingulum on their anterior surfaces; their grinding surfaces are deeply excavated, and when worn

[1] Quart. Journ. Geol. Soc. vol. xv. p. 602 (1859).

present but two fossettes; the true molars have a well-developed buttress, and the premolars have a strong cingulum on the inner surface. As in the three preceding species, the first premolar in both jaws disappeared at a very early age. The lower cheek-teeth are likewise low-crowned, and the plane of dentition is oblique.

Hab. Europe (Pleistocene and Pliocene).

37340. Cast of the anterior two thirds of the cranium, showing the last three premolars and the first two true molars. The original is from the Upper Pliocene of the Val d'Arno, Italy, and is preserved in the Florentine Museum at Pisa. It is noticed and figured in 'Falconer's Palæontological Memoirs,' vol. ii. p. 359, pl. xxviii. fig. 1; and from this note it appears to have been much damaged since the cast was taken. *Purchased*, 1863.

112 (O. C.). Hinder portion of a cranium provisionally referred to this species; from the Pleistocene (?) of the Via Appia, Rome. *Gualteris Collection. Purchased. Before* 1836.

40955. Two fragments of the right maxilla, one showing pm. 2 and pm. 3, and the other the three true molars; from the Upper Pliocene of Malaga, Spain. This specimen is described by Falconer in the Quart. Journ. Geol. Soc. vol. xv. p. 602 (1859), and in his 'Palæontological Memoirs,' vol. ii. p. 361. *Presented by Prof. Ansted*, 1868.

37342. Cast of the anterior portion of the palate, showing the last two premolars and m. 1. The original is from the Upper Pliocene of the Val d'Arno. *Purchased*, 1863.

40803. Cast of the upper cheek-dentition of the right side. The cast is taken from a palate specimen (figured in 'Falconer's Palæontological Memoirs,' vol. ii. pl. xxix.) preserved in the University Museum at Bologna, and apparently obtained om the Upper Pliocene of the Val d'Arno.
Presented by C. Falconer, Esq., 1867.

40815. Cast of the second left upper true molar. The original is from the Pleistocene near Rome.
Presented by C. Falconer, Esq., 1867.

40816. Cast of a fragment of the left maxilla containing m. 1 and m. 2. The original is probably from the Upper Pliocene of the Val d'Arno. *Presented by C. Falconer, Esq.*, 1867.

34733. The third left upper true molar; from the Upper Pliocene (*Fig.*) of Peyrolles (Puy-de-Dôme), France. Figured by Boyd-Dawkins in the Quart. Journ. Geol. Soc. vol. xxiv. pl. viii. fig. 5 (1868). *Bravard Collection. Purchased*, 1852.

34734. The third left upper premolar; from the Upper Pliocene of (*Fig.*) Peyrolles. Figured by Boyd-Dawkins, *op. cit.* pl. viii. fig. 2. *Bravard Collection. Purchased*, 1852.

28804. The first left upper true molar; from the Upper Pliocene of (*Fig.*) the Val d'Arno. Figured by Boyd-Dawkins, *op. cit.* pl. viii. fig. 3. *Presented by J. B. Pentland, Esq.*, 1853.

40810. Casts of the right pm. 4 and m. 2 and the left m. 3. The originals are from the Upper Pliocene of the Val d'Arno, and are believed to be in the Florentine Museum at Pisa. The casts are figured in 'Falconer's Palæontological Memoirs,' vol. ii. pl. xxv. figs. 5–7.
Presented by C. Falconer, Esq., 1867.

33323–4. A left and a right second upper true molar; from the Forest-bed of the Norfolk coast.
Layton Collection. Purchased, 1858.

43480. Casts of the right pm. 2, pm. 3, m. 1, and m. 2. The originals are from the Forest-bed of Pakefield, Suffolk; and (together with pm. 4) are figured (reversed) by Boyd-Dawkins, *op. cit.* pl. vii. fig. 1.
Presented by Prof. Boyd-Dawkins, 1872.

43480 a. Cast of the third right upper true molar. The original is from the Forest-bed of Pakefield, and is figured by Boyd-Dawkins, *op. cit.* pl. viii. fig. 4.
Presented by Prof. Boyd-Dawkins, 1872.

43482. Cast of the third right upper true molar. The original is from the Forest-bed of Cromer, Norfolk.
Presented by Prof. Boyd-Dawkins, 1872.

37341. Cast of the complete mandible. The original is from the Upper Pliocene of the Val d'Arno, and is preserved in the Museum at Florence; it is figured in 'Falconer's Palæontological Memoirs,' vol. ii. pl. xxvii. figs. 2, 3. The extremely small size of the spatulate extremity of the symphysis is noticeable. *Purchased*, 1863.

37343. Cast of part of the symphysis and the two rami of the mandible, showing the last five cheek-teeth on the left side. The original is from the Upper Pliocene of the Val d'Arno, and is preserved in the museum at Pisa.
Purchased, 1863.

40809. Cast of the symphysis of the mandible. The original is from the Upper Pliocene of the Val d'Arno, and is in the Museum at Florence; it is described and figured in 'Falconer's Palæontological Memoirs,' vol. ii. p. 360, pl. xxviii. figs. 2–4.
Presented by C. Falconer, Esq., 1867.

28802. (*Fig.*) Part of the left ramus of the mandible, containing the last four cheek-teeth; from the Upper Pliocene of the Val d'Arno. Figured in 'Falconer's Palæontological Memoirs,' vol. ii. pl. xxii. fig. 4.
Presented by J. B. Pentland, Esq., 1853.

28803. Fragment of the left ramus of the mandible with two true molars; from the Upper Pliocene of the Val d'Arno.
Presented by J. B. Pentland, Esq., 1853.

33326. (*Fig.*) Fragment of the left ramus of the mandible, containing $\overline{\text{pm. 4}}$, $\overline{\text{m. 1}}$, and $\overline{\text{m. 2}}$; dredged off Happisburgh, Norfolk. Figured in 'Falconer's Palæontological Memoirs,' vol. ii. pl. xxii. fig. 3. *Layton Collection. Purchased*, 1858.

43480. Cast of the left lower cheek-dentition. The original of this specimen is from the Forest-bed of Pakefield, and is figured by Boyd-Dawkins in the Quart. Journ. Geol. Soc. vol. xxiv. pl. vii. fig. 3.
Presented by Prof. Boyd-Dawkins, 1872.

40862. A left lower cheek-tooth; from the Forest-bed of Norfolk.
Presented by C. Falconer, Esq., 1867.

33325. A right lower cheek-tooth, perhaps belonging to this species; dredged off Happisburgh.
Layton Collection. Purchased, 1858.

34732. The greater part of the right scapula; from the Upper Pliocene of Etueaires, Puy-de-Dôme.
Bravard Collection. Purchased, 1855.

33470. The distal third of a right humerus, provisionally referred to that species; dredged off Happisburgh.
Layton Collection. Purchased, 1858.

28803 a. The right femur; from the Upper Pliocene of the Val d'Arno. *Presented by J. B. Pentland, Esq.*, 1853.

28810. The right magnum; from the Upper Pliocene of the Val d'Arno. *Presented by J. B. Pentland, Esq.*, 1853.

33470 a. The distal extremity of a right tibia, provisionally referred to this species; dredged off Happisburgh. *Layton Collection. Purchased*, 1858.

28805. The right tibia; from the Upper Pliocene of the Val d'Arno. *Presented by J. B. Pentland, Esq.*, 1853.

28806. The right astragalus; from the Upper Pliocene of the Val d'Arno. *Presented by J. B. Pentland, Esq.*, 1853.

28808. The left third metatarsal; from the Upper Pliocene of the Val d'Arno. *Presented by J. B. Pentland, Esq.*, 1853.

17696. A first phalangeal of a third digit; from the Forest-bed of Bacton, Norfolk. *Green Collection. Purchased*, 1843.

7407. The first sacral vertebra; from the Upper Pliocene of the Val d'Arno. *Mantell Collection. Purchased*, 1836.

40936. A middle cervical vertebra, provisionally referred to this species; from the Forest-bed of Norfolk. *Presented by C. Falconer, Esq.*, 1867.

Rhinoceros pachygnathus, Wagner[1].

The narial septum is not ossified, and the nasals are very short and broad; the upper true molars have a buttress, and but two fossettes on their worn crowns. This species has been regarded as the ancestor of the African *R. simus*, but its molars are of a different type, and the cranium is shorter.

Hab. S. Europe.

49681. Proximal part of the left ulna; from the Lower Pliocene of Pikermi, Attica. *Purchased*, 1879.

49682. The left scaphoid; from Pikermi. *Purchased*, 1879.

49683. The left lunar; from Pikermi. *Purchased*, 1879.

49684. The right unciform; from Pikermi. *Purchased*, 1879.

[1] Abh. math.-phys. Cl. k.-bay. Ak. Wiss. vol. v. pt. 2, p. 349 (1848).

49680. The greater portion of the bones of the lower half of the left hind limb, comprising the tibia, calcaneum, astragalus, navicular, entocuneiform, cuboid, and the metatarsus; from Pikermi. *Purchased*, 1879.

B. *Ceratorhine Group.*

There are two horns; cutting-teeth are developed in both jaws, and the upper true molars have a buttress. There are three digits in the manus.

Rhinoceros schleiermacheri, Kaup[1].

Syn. *Rhinoceros sansaniensis*, Lartet[2].
Dihoplus schleiermacheri, Brandt[3].

Dentition:—I. $\frac{2}{1}$, C. $\frac{0}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$. The upper cheek-teeth are exceedingly like those of *R. incisivus*, but are usually larger; the third true molar is distinguished by the presence of a tubercle, instead of a minute talon, on the posterior surface, while the premolars are distinguished by the absence of an inner cingulum. In the Eppelsheim cranium pm. 4 has three costæ. The colles of the premolar are usually united for at least half their height, so that there is a deep descent into the median valley. The lower canines are smaller than in *R. incisivus*, and the mandibular symphysis relatively wider and flatter. It is very difficult to distinguish isolated first and second upper true molars of the two species, although those of the present species have no external cingulum. The present form is rather larger than *R. sumatrensis*, from which it is readily distinguished by the structure of the teeth, and the form of the nasals and premaxillæ. It apparently ranges from the Middle Miocene of Sansan to the Lower Pliocene of Pikermi. The Sansan race is of smaller size than that of Eppelsheim.

Hab. Europe.

M. 2781. Cast of the cranium and mandible. The original is from the Upper Miocene of Eppelsheim, Hessen Darmstadt, and is preserved in the Museum at Darmstadt; it is figured by Kaup in the Oss. Foss. d. Darmstadt, pt. 3, pl. x. fig. 1, and in the 'Beiträge,' pt. 1, pl. x. fig. 1. The dentition is figured in pl. xi. fig. 5 of the former work. *Purchased.*

49660. Cast of a laterally crushed cranium. The original is from the Upper Miocene of Eppelsheim. *Purchased*, 1878.

[1] Isis, 1832, p. 902.
[2] In Laurillard's Dict. Univ. d'Hist. Nat. vol. xi. p. 101 (1849).
[3] Mém. Ac. Imp. St. Pétersbourg, sér. 7, vol. xxvi. art. 5, p. 49 (1878).

27460. Fragment of the left maxilla, containing m. 2 and m. 3; from the Middle Miocene of Sansan (Gers), France. This specimen is rather smaller than the corresponding part of the preceding crania, but m. 3 has the characteristic posterior tubercle. *Hastings Collection. Purchased*, 1855.

110 b (O. C.). Cast of the right maxilla of a young individual, showing the last three milk-molars. The original is from Eppelsheim, and is figured by Kaup in the Oss. Foss. d. Darmstadt, pt. 3, pl. xi. fig. 7. *Purchased.*

M. 238. The first right upper premolar; from Eppelsheim. *Enniskillen Collection. Purchased*, 1882.

M. 2773. Cast of the first right upper premolar. The original is from Eppelsheim, and is figured by Kaup, *op. cit.* pl. xii. fig. 1. *Egerton Collection. Purchased*, 1882.

M. 470. The well-worn fourth right upper premolar; from Eppelsheim. This specimen agrees with the corresponding tooth of the cranium in the presence of three costæ and the absence of an inner cingulum. *Enniskillen Collection. Purchased*, 1882.

21484. The slightly worn fourth right upper premolar; from Eppelsheim. This specimen exhibits the three costæ. *Purchased from Dr. Kaup*, 1847.

21017 The first right upper true molar; from Eppelsheim. *Purchased from Dr. Kaup*, 1847.

M. 2774. Cast of the first left upper true molar. The original is from Eppelsheim, and is figured (reversed) by Kaup, *op. cit.* pl. xii. fig. 5. *Egerton Collection. Purchased*, 1882.

1249. The second right upper true molar; from Eppelsheim. *Purchased from Dr. Kaup.*

27463. The second left upper true molar; from Eppelsheim. *Hastings Collection. Purchased*, 1855.

M. 2775. Cast of the second right upper true molar. The original is from Eppelsheim, and is figured by Kaup, *op. cit.* pl. xii. fig. 6. *Egerton Collection. Purchased*, 1882.

42718. The well-worn second right upper true molar; from Sansan. *Presented by the Trustees of the Christie Museum*, 1871.

M. 237, 470 a. Two specimens of the third upper true molar; from Eppelsheim. *Enniskillen Collection. Purchased*, 1882.

27465. The third right upper true molar; from Eppelsheim. *Hastings Collection. Purchased*, 1855.

21017 a. The third right upper true molar; from Eppelsheim. *Purchased from Dr. Kaup*, 1847.

M. 2776. Cast of the third left upper true molar. The original is from Eppelsheim, and is figured by Kaup, *op. cit.* pl. xi. fig. 6. *Egerton Collection. Purchased*, 1882.

M. 2777. Cast of the third left upper true molar. The original is from Eppelsheim. *Egerton Collection. Purchased*, 1882.

M. 2778. Cast of the fourth left upper milk-molar. The original is from Eppelsheim, and is figured (reversed) by Kaup, *op. cit.* pl. xii. fig. 3. *Egerton Collection. Purchased*, 1882.

M. 2779. Casts of three upper incisors. The originals are from Eppelsheim, and are figured by Kaup, *op. cit.* pl. xi. figs. 1–3. *Egerton Collection. Purchased*, 1882.

M. 2782. Cast of the symphysis and left ramus of the mandible. The original is from Eppelsheim, and is figured by Kaup, *op. cit.* pl. xi. fig. 8. *Purchased.*

39922. Part of the left ramus of a small mandible, with the last five cheek-teeth, provisionally referred to this species; from the Middle Miocene of Steinheim, Bavaria. *Purchased*, 1866.

The following specimens of the mandible belong either to this species or R. incisivus, *since when the symphysis is wanting it appears impossible to distinguish between the mandibles of the two species.*

19433. Part of the left ramus of the mandible, showing the last six cheek-teeth; from Eppelsheim. *Purchased from Dr. Kaup*, 1845.

21021. Part of the left ramus of the mandible, showing $\overline{\text{pm. 2}}$, $\overline{\text{pm. 3}}$, $\overline{\text{m. 1}}$, and $\overline{\text{m. 2}}$; from Eppelsheim. *Purchased from Dr. Kaup*, 1847.

21022. Part of the left ramus of the mandible, with the last six cheek-teeth; from Eppelsheim. *Purchased from Dr. Kaup*, 1847.

21490. The nearly complete right ramus of the mandible of an immature individual; from Eppelsheim.
Purchased from Dr. Kaup, 1847.

27462. The mandible, wanting the greater part of the symphysis; from Eppelsheim. *Hastings Collection. Purchased*, 1855.

27462 a. Fragment of the left ramus of the mandible, with three cheek-teeth; from Eppelsheim.
Hastings Collection. Purchased, 1855.

M. 234. Part of the right ramus of the mandible, with the last three premolars and $\overline{\text{m. 1}}$; from Eppelsheim.
Enniskillen Collection. Purchased, 1882.

21020. Part of the left ramus of the mandible of an immature individual, showing the alveolus of $\overline{\text{pm. 1}}$ and all the other cheek-teeth, $\overline{\text{m. 3}}$ being *in alveolo*; from Eppelsheim.
Purchased from Dr. Kaup, 1847.

113 (O. C.). Part of the left ramus of the mandible, showing $\overline{\text{pm. 4}}$ and the three true molars; from Eppelsheim. *Purchased.*

19434. Part of the left ramus of the mandible, with the three true molars; from Eppelsheim.
Purchased from Dr. Kaup, 1845.

1254. Part of the right ramus of the mandible, showing $\overline{\text{pm. 3}}$, $\overline{\text{pm. 4}}$, $\overline{\text{m. 1}}$; from Eppelsheim. *Purchased from Dr. Kaup.*

21262. Part of the left ramus of the mandible of a young individual, with $\overline{\text{mm. 4}}$; from Eppelsheim.
Purchased from Dr. Kaup, 1847.

110 e (O. C.). Cast of part of the symphysis and the left ramus of the mandible of a young individual, showing $\overline{\text{mm. 1}}$, $\overline{\text{mm. 2}}$, and part of $\overline{\text{mm. 3}}$. The original is from Eppelsheim, and is figured by Kaup in the Oss. Foss. d. Darmstadt, pt. 3, pl. xi. fig. 10. *Purchased.*

1253. A lower canine; from Eppelsheim.
Purchased from Dr. Kaup.

21490, 24016. Two lower canines; from Eppelsheim.
Purchased from Dr. Kaup.

M. 2780. Cast of a lower canine. The original is from Eppelsheim, and is figured (reversed) by Kaup, *op. cit.* pl. xi. fig. 9.
Egerton Collection. Purchased, 1882.

The following specimens, of which the originals are from Hessen-Darmstadt, are referred by Kaup to the present species. They were all obtained by purchase.

M. 2783. Cast of the right humerus. Figured by Kaup, *op. cit.* pl. xiii. fig. 4.

1281. Cast of the left scaphoid. Figured, *op. cit.* pl. xiii. fig. 9.

M. 2787. Cast of the unciform. Figured, *op. cit.* pl. xiii. fig. 8.

1282. Cast of the left third metacarpal. Figured, *op. cit.* pl. xiii. fig. 13.

19446. A similar left third metacarpal, wanting the distal epiphysis.

1283. Cast of the left femur, wanting the head. Figured, *op. cit.* pl. xiii. fig. 5.

M. 2784. Cast of the left tibia. Figured, *op. cit.* pl. xiii. fig. 6.

M. 2785. Cast of the left calcaneum. Figured, *op. cit.* pl. xiii. fig. 10.

110 (O. C.). Cast of the left calcaneum.

M. 2786. Cast of the right astragalus. Figured, *op. cit.* pl. xiii. fig. 11.

110 a (O. C.). Cast of the right navicular. Figured, *op. cit.* pl. xiii. fig. 7.

1284. Cast of the atlas vertebra. Figured, *op. cit.* pl. xiii. fig. 1.

1285. Cast of the axis vertebra. Figured, *op. cit.* pl. xiii. fig. 2.

The following specimens from Sansan may belong either to this species or R. incisivus; *they are too small for* R. goldfussi, *and the astragalus is different in shape. Purchased.*

27455*. The glenoidal extremity of the right scapula.

27455. The left humerus.

27456. A rather longer left humerus.

27459. The left radius.

29641. The right third metacarpal.

29642. The proximal half of the right third metacarpal.

27457. The distal extremity of the left femur.

29644. The left patella.

27458. The left tibia.

21875. The left calcaneum.

29645. The right astragalus.

21874. A smaller left astragalus, probably associated with No. 21875.

29646. The right third metatarsal.

C. *Rhinocerotine Group.*

There is but one nasal horn, and cutting-teeth are present in both jaws; a buttress may or may not be present in the upper true molars. There are three digits in the manus.

Rhinoceros sondaicus, Cuvier[1].

Syn. *Rhinoceros javanicus*, F. Cuvier[2].

Dentition:—I. $\frac{1}{1}$, C. $\frac{0}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$. The upper true molars very closely resemble those of *R. sumatrensis*; but the "posterior valley" is relatively shallower, and the length of the anterior usually exceeds that of the external surface. The buttress is strongly developed, and there is no "combing-plate."

Hab. Bengal, Burma, Malay Peninsula, Java, Sumatra, and Borneo. It has been recorded from Pleistocene or Prehistoric deposits in the latter island by Busk in the Proc. Zool. Soc. 1869, p. 409[3].

M. 1968. Two first or second upper true molars of opposite sides and three lower cheek-teeth, provisionally referred to this species; from a depth of sixty feet in a cavern deposit at Saráwak, Borneo. The upper teeth present all the characters of those of *R. sondaicus*.

Presented by P. L. Sclater, Esq., 1884.

M. 1969–70. Several bones (comprising part of a scapula, radius, the complete left third metatarsal, a broken lateral metapodial, and two fragments of a cervical vertebra) associated with the preceding specimens.

Presented by P. L. Sclater, Esq., 1884.

[1] In Desmarest's 'Mammalogie,' p. 399 (1822).

[2] Hist. Nat. des Mammifères, vol. iii. liv. 45, p. 2 (1824).

[3] See Flower, Cat. Vert. Anim. Mus. Roy. Coll. Surg. pt. ii. Mammalia, p. 420, no. 2140 (1884).

Rhinoceros sivalensis, Falconer and Cautley [1].

Syn. *Rhinoceros sinensis,* Owen [2].
Zalabis sivalensis, Cope [3].

Dentition :—I. $\frac{1}{(0-1)}$, C. $\frac{0}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$. This species is apparently allied to *R. sondaicus* (of which it is probably the ancestor), but is usually of larger size. There are two fossettes on the worn crowns of the true molars; there is no distinct "antecrochet," but a well-developed "buttress." Koken [4] unites one of the type specimens of *R. sinensis* with this species, but provisionally retains the other as distinct. The writer is inclined to think that both may be included.

Hab. India and China.

39626. (*Fig.*) The middle portion of the cranium, showing the last five cheek-teeth, in a well-worn and somewhat imperfect condition; from the Pliocene of the Siwalik Hills. The right dentition is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. lxxv. fig. 5, and in 'Falconer's Palæontological Memoirs,' vol. i. pl. xiv. fig. 2. This and the following specimens are the types.

Presented by Dr. Hugh Falconer.

39647. (*Fig.*) The anterior portion of the cranium, showing the whole or portions of each of the seven cheek-teeth; from the Siwalik Hills. Figured in Royle's 'Botany &c. of the Himalaya Mountains,' pl. vi. fig. 5, and in the 'Fauna Antiqua Sivalensis,' pl. lxxiii. fig. 3, and pl. lxxiv. fig. 5. The first and second true molars are in good preservation, and agree with the less worn specimen figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. i. pl. v. fig. 5, and vol. iii. pl. i. fig. 7: the right $\underline{\text{m. 3}}$ has been found and put in position since the specimen was figured. *Cautley Collection. Presented,* 1842.

39625. (*Fig.*) The cranium, wanting the left zygomatic arch and the extremities of the premaxillæ and nasals, but exhibiting the last six cheek-teeth, in a half-worn and much-broken condition; from the Siwalik Hills. Figured in the 'Fauna

[1] Fauna Antiqua Sivalensis, pt. 7, pl. lxxiii. (1847).
[2] Quart. Journ. Geol. Soc. vol. xxvi. p. 424 (1870).
[3] Amer. Nat. vol. xiii. p. 771 *b* (1879).
[4] Pal. Abhand. vol. iii. pt. 2, pp. 24, 30 (1885).

Antiqua Sivalensis,' pl. lxxiii. fig. 2, and in 'Falconer's Palæontological Memoirs,' vol. i. pl. xiv. fig. 1.

Presented by Dr. Hugh Falconer.

39674. The first left upper true molar, in an early condition of wear; from the Siwalik Hills. The buttress is broken away. *Cautley Collection. Presented*, 1842.

41935. (*Fig.*) The third left upper true molar, wanting the outer half; from a cave near Chung-king-foo, Sechuan, China. This specimen is described and figured by Owen in the Quart. Journ. Geol. Soc. vol. xxvi. p. 424, pl. xxix. figs. 1, 2 (1870), under the name of *R. sinensis* (of which it is the type); it is also figured by Koken (as *R. sivalensis*) in the Pal. Abhand. vol. iii. pt. 2, pl. vi. fig. 4, together with a perfect specimen. Except in being somewhat smaller, it presents no characters by which it can be distinguished from m. 3 of No. 39647. This smaller size renders it very difficult to distinguish this tooth from m. 3 of *R. sondaicus*; but the form of pm. 4, and the other mammals with which the Chinese specimens are associated, indicate that their affinity is with the Siwalik form. A specimen figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pl. v. fig. 4, agrees more nearly in size with the present example.

Purchased from R. Swinhoe, Esq., 1870.

41936. The hinder half of the much-worn m. 1; from the same locality. Noticed by Owen, *op. cit.* p. 425. This specimen agrees precisely in form with m. 1 of No. 39626.

Purchased from R. Swinhoe, Esq., 1870.

41936 a. (*Fig.*) The outer lamina of a fourth left upper premolar; from the same locality. Figured by Owen, *op. cit.* pl. xxix. fig. 3, as *R. sinensis*. A similar tooth is figured by Koken, *op. cit.* pl. vi. fig. 1, under the same name; but apparently presents no characters by which it can be distinguished from an upper premolar of *R. sivalensis* figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol ii. pl. v. fig. 6. The hinder costa is much more developed than in *R. sondaicus*. *Purchased from R. Swinhoe, Esq.*, 1870.

41941–4. Five lower cheek-teeth; from the same locality. Noticed by Owen, *op. cit.*

Purchased from R. Swinhoe, Esq., 1870.

39646. (*Fig.*) The symphysis of the mandible, showing the left canine, the alveolus of the right, and the broken bases of the incisors; from the Siwalik Hills. This specimen is figured by Falconer and Cautley, *op. cit.* pl. lxxiv. fig. 4, under the name of *R. palæindicus*, but is referred to this species by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 38[1]. A very similar specimen, which does not show incisive alveoli, is figured in pl. vi. fig. 3 of that volume. *Cautley Collection. Presented*, 1842.

Rhinoceros palæindicus, Falconer and Cautley[2].

Dentition:—I. $\frac{1}{1}$, C. $\frac{0}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$.

This species is readily distinguished from the last by the absence of a "buttress" to the upper true molars, and their horizontal wear, as well as by the usual presence of three fossettes on the worn crowns of the latter. The upper true molars are somewhat simpler than those of *R. unicornis*, of which the present species may be the ancestor.

Hab. India.

16444. (*Fig.*) The cranium, wanting the extremities of the premaxillæ and nasals, and showing the last six cheek-teeth, in a much-worn and somewhat battered condition; from the Pliocene of the Siwalik Hills, India. Figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. lxxiii. fig. 1. This and the following specimens are the types; the three fossettes are shown in several of the teeth.

Cautley Collection. Presented, 1842.

M. 2727. (*Fig.*) The cranium, incomplete anteriorly, but showing the last four cheek-teeth; from the Siwalik Hills. Figured in the 'Fauna Antiqua Sivalensis,' pl. lxxiv. fig. 2. Three fossettes occur in m. 1.

Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

M. 2728. Middle portion of a cranium apparently belonging to a smaller individual of this species; from the Siwalik Hills. On the right side the three true molars are shown, and in the absence of a "buttress" agree with those of the present species. *Cautley Collection. Presented*, 1842.

[1] The cast, from which the description was taken, did not show the existence of the incisors.

[2] Fauna Antiqua Sivalensis, pt. 7, pl. lxxiii. (1847).

M. 2729. The cranium, wanting the nasals, premaxillæ, and most of the teeth; from the Siwalik Hills.
Cautley Collection. Presented, 1842.

39643. (*Fig.*) Fragment of a right maxillary region, with portions of the seven cheek-teeth, in a much-worn and battered condition, apparently belonging to this species; from the Siwalik Hills. Figured in the 'Fauna Antiqua Sivalensis,' pls. lxxii. fig. 3, and lxxv. fig. 9, under the name of *R. platyrhinus*. *Cautley Collection. Presented*, 1842.

36740. (*Fig.*) The cranium of a young individual, wanting the nasals and the extremity of the premaxillæ, and showing the four milk-molars and m. 1 *in alveolo*; from the Siwalik Hills. Figured in the 'Fauna Antiqua Sivalensis,' pl. lxxiv. fig. 1; the dentition being figured (from a cast) by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pl. vii.
Presented by the Secretary of State for India, 1860.

39648. (*Fig.*) The second right upper true molar; from the Siwalik Hills. This specimen (woodcut, fig. 15) is figured in the 'Fauna Antiqua Sivalensis,' pl. lxxv. fig. 4 (as a premolar), and

Fig. 15.

Rhinoceros palæindicus.—The second right upper true molar (reversed); from the Siwalik Hills. ½. (From the 'Palæontologia Indica.')

by the present writer in the 'Palæontologia Indica,' ser. 10, vol. iii. p. 4. It exhibits very clearly the absence of a buttress. *Cautley Collection. Presented*, 1842.

M. 2730. A much-worn first left upper true molar; from the Siwalik Hills. *Cautley Collection. Presented*, 1842.

39669. The third right upper true molar; from the Siwalik Hills. *Cautley Collection. Presented*, 1842.

39670. Fragment of the right maxilla of a young individual, showing the first three milk-molars, which agree precisely with those of No. 36740; from the Siwalik Hills. *Cautley Collection. Presented*, 1842.

M. 2815. Cast of the right maxilla of a young individual, showing the first three milk-molars. The original is from the Siwalik Hills, and is preserved in the Dublin Museum of Science and Art; it is figured by Baker and Durand in the Journ. As. Soc. Beng. vol. v. pl. xix. fig. 2, and by the present writer in the Trans. R. Dublin Soc. ser. 2, vol. iii. pl. iii. fig. 1 (1884). *Presented by Dr. Hugh Falconer.*

39673. The third right upper milk-molar; from the Siwalik Hills. *Cautley Collection. Presented*, 1842.

39671, 39672, M. 2461. Three fragments of the maxillæ of young (*Fig.*) individuals, provisionally referred to this species, each showing mm. 2 and mm. 3; from the Siwalik Hills. No. 39671 is figured (from a cast) by the present writer in the Palæontologia Indica,' ser. 10, vol. ii. pl. vii. fig. 4, under the name of *R. platyrhinus*; but it does not appear that it can be distinguished from the preceding specimens. *Cautley Collection. Presented*, 1842.

39620. The anterior portion of a mandible, provisionally referred to (*Fig.*) this species; from the Siwalik Hills. This specimen is figured by Falconer and Cautley, *op. cit.* pl. lxxii. fig. 4, under the name of *R. platyrhinus*. It shows several of the cheek-teeth and the broken bases of the canines and incisors. *Presented by Gen. Sir W. E. Baker, K.C.B.*, 1848.

39642. The symphysis and part of the right ramus of a similar (*Fig.*) mandible of an immature individual; from the Siwalik

Hills. Figured by Falconer and Cautley, *op. cit.* pl. lxxv. fig. 10, and in 'Falconer's Palæontological Memoirs,' vol. i. pl. xiv. fig. 4, as *R. platyrhinus*: it shows the incisors, canines, pm. $\frac{1}{1}$, pm. $\frac{2}{2}$, pm. $\frac{3}{3}$, mm. $\frac{4}{4}$, and m. $\frac{1}{1}$.

Cautley Collection. Presented, 1842.

39644. (*Fig.*) Hinder part of the left ramus of a mandible perhaps belonging to this species; from the Siwalik Hills. Figured by Falconer and Cautley, *op. cit.* pl. lxxiv. fig. 3.

Cautley Collection. Presented, 1842.

The following specimens are not specifically determined; they were all obtained from the Siwalik Hills, and, unless otherwise stated, belong to the Cautley Collection. Presented, 1842.

39621. Fragment of a mandibular ramus, with one much-worn molar.

M. 2732. Part of the right ramus of the mandible, with the last four teeth.

M. 2733. Part of the right ramus of the mandible, with the three true molars (broken).

39645. (*Fig.*) Part of the right ramus of the mandible of a young individual, with the four milk-molars. Figured by Falconer and Cautley, *op. cit.* pl. lxxv. fig. 3, as *R. palæindicus*.

39689. The left ramus of a rather younger, but very similar mandible, with the corresponding teeth.

Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

39690. Part of the left ramus of a very similar mandible, with the last three milk-molars (imperfect).

Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

M. 2460. Fragment of the right ramus of the mandible of a young individual, with mm. $\frac{2}{2}$ and mm. $\frac{3}{3}$.

39683. Two fragments of young mandibles, each with two teeth.

40832. The glenoidal half of the left scapula of a large form.

Presented by C. Falconer, Esq., 1867.

39606. (*Fig.*) The associated right humerus, radius, and ulna. Figured by Baker and Durand in the Journ. As. Soc. Beng. vol. v. pl. xvii. figs. 1, 2, and by Falconer and Cautley, *op. cit.* pl. lxxvii. fig. 1.

Presented by Gen. Sir W. E. Baker, K C.B., 1848.

17108. The proximal portion of the left humerus. Figured by
(*Fig.*) Falconer and Cautley, *op. cit.* pl. lxxvii. fig. 3.

39607. The proximal portion of the right humerus. Figured,
(*Fig.*) *op. cit.* pl. lxxvii. fig. 2 (together with No. 39608).
Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

39608. The distal extremity of the right humerus. Figured, *op. cit.*
(*Fig.*) pl. lxxvii. fig. 2 (together with No. 39607).
Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

39629. The distal half of the right humerus. Figured, *op. cit.*
(*Fig.*) pl. lxxvii. fig. 4.

14748. The distal half of the right humerus. Figured, *op. cit.*
(*Fig.*) pl. lxxvii. fig. 5.

39657. The proximal extremity of the right radius and ulna.
(*Fig.*) Figured, *op. cit.* pl. lxxvii. fig. 6.

39658. The left radius and proximal extremity of the ulna. Figured,
(*Fig.*) *op. cit.* pl. lxxvii. fig. 7.

39627. The right ulna, wanting the proximal extremity. Figured,
(*Fig.*) *op. cit.* pl. lxxvii. fig. 9. *Presented by Dr. Hugh Falconer.*

39630. The distal half of the right radius. Figured, *op. cit.*
(*Fig.*) pl. lxxvii. fig. 8.

15765–6. Two specimens of the scaphoid. Figured, *op. cit.* pl. lxxix.
(*Fig.*) figs. 1, 2.

15767, 39660, 39661, 39662. Four specimens of the cuneiform.
(*Fig.*) The three first specimens are figured, *op. cit.* pl. lxxix.
figs. 4–5.

17569, 39633, 39634. Three specimens of the second metacarpal.
(*Fig.*) Figured, *op. cit.* pl. lxxix. figs. 7–9.

39655. The right third metacarpal, imperfect distally. Figured,
(*Fig.*) *op. cit.* pl. lxxix. fig. 12.

39612, 39613. The right and left third metacarpals. Figured,
(*Fig.*) *op. cit.* pl. lxxix. figs. 10, 11.
Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

39632. The left fourth metacarpal. Figured, *op. cit.* pl. lxxix.
(*Fig.*) fig. 13.

39614. The left fourth metacarpal.
Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

17122. Middle portion of the left femur. Figured, *op. cit.* pl. lxxviii. (*Fig.*) fig. 2.

39663–4. Two specimens of the patella. Figured, *op. cit.* pl. lxxviii. (*Fig.*) figs. 6, 7.

15365 a. A patella, of very large size.

39609. The left tibia and fibula. Figured by Baker and Durand in (*Fig.*) the Journ. As. Soc. Beng. vol. v. pl. xviii., and by Falconer and Cautley, *op. cit.* pl. lxxviii. fig. 3.
Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

39659. The left tibia of a smaller species. Figured by Falconer and (*Fig.*) Cautley, *op. cit.* pl. lxxviii. fig. 4.

39610. The right tibia, wanting the proximal extremity, of equal (*Fig.*) size. Figured, *op. cit.* pl. lxxviii. fig. 5.
Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

39637. The right calcaneum. Figured, *op. cit.* pl. lxxviii. fig. 9. (*Fig.*)

39637 a. The right calcaneum.

39638. The left calcaneum. Figured, *op. cit.* pl. lxxviii. fig. 11. (*Fig.*)

39639. The left calcaneum. Figured, *op. cit.* pl. lxxviii. fig. 10. (*Fig.*)

39611. The left calcaneum, of very large size.
Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

39665. The right astragalus.

39666. The right astragalus.

39640. The right astragalus. Figured, *op. cit.* pl. lxxviii. fig. 12. (*Fig.*)

39667. The left astragalus.

39668. The left astragalus.

40908. The right cuboid. *Presented by C. Falconer, Esq*, 1867.

39684. The right cuboid.

39662. The left cuboid. Figured, *op. cit.* pl. lxxix. fig. 22.

39631. (*Fig.*) The associated right astragalus, navicular, cuboid, three cuneiforms, and the portion of the second and third metatarsals. Figured, *op. cit.* pl. lxxviii. fig. 8.

39615. The left third and fourth metatarsals, of very large size. *Presented by Gen. Sir W. E. Baker, K.C.B.*, 1848.

18418. (*Fig.*) The right third metatarsal. Figured, *op. cit.* pl. lxxix. fig. 17.

39622. (*Fig.*) The left third metatarsal. Figured, *op. cit.* pl. lxxix. fig. 19. *Presented by Gen. Sir W. E. Baker, K.C.B.*, 1848.

39636. (*Fig.*) The right second metatarsal. Figured, *op. cit.* pl. lxxix. fig. 16.

39623. (*Fig.*) The left fourth metatarsal. Figured, *op. cit.* pl. lxxix. fig. 18.

39681–2. Two specimens of the centrum of the axis vertebra, one much larger than the other.

M. 2734. An early cervical vertebra.

M. 2735. The seventh cervical vertebra.

M. 2736. The third dorsal vertebra (imperfect).

M. 2737. The third or fourth dorsal vertebra (imperfect).

M. 2738. An early dorsal vertebra (imperfect).

Rhinoceros unicornis, Linn.[1]

Syn. *Rhinoceros indicus*, Cuvier[2].

The upper true molars have very tall crowns, a "combing-plate," three fossettes on the well-worn crowns, and no "buttress." Teeth of this species have been described from the Pleistocene of the Narbada Valley, India, by the present writer in the 'Palæontologia Indica' (Mem. Geol. Surv. Ind.), ser. 10, vol. i. pp. viii–ix[3].

[1] Syst. Nat. ed. 12, vol. i. p. 104 (1766).

[2] Ménag. d. Mus. d'Hist. Nat. (1801).

[3] A scapula is noticed on the same page under the name of *R. namadicus*, but its right to specific distinction is perhaps doubtful.

Hab. (Recent) Nipal, Bhutan, and Assam; (Prehistoric (?)) Madras [1]; and (Pleistocene) Narbada Valley.

39686. (*Fig.*) A left astragalus, provisionally referred to the species; from the Pleistocene of the Narbada Valley, India. Figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. lxxvi. fig. 18.

Presented by C. Fraser, Esq. Before 1843.

D. *Diceratherine Group* [2].

The nasals, although small, are strongly curved, and each carries a small process, which probably formed the point of attachment of a small lateral horn. Upper and lower incisors and lower canines are present. There are apparently three digits in the manus.

Dentition [3]:—I. $\frac{1}{1}$, C. $\frac{0}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$.

Rhinoceros minutus, Cuvier [4].

Syn. (?) *Rhinoceros steinheimensis,* Jäger [5].
Rhinoceros tapirinus, Pomel [6] (? *in parte*).
Rhinoceros paradoxus, Pomel [7] (? *in parte*).
Rhinoceros pleuroceros, Duvernoy [8].
Aceratherium minutum, Kaup [9].
Diceratherium pleuroceros, Cope [10].

This species is of small size; the upper true molars have a well-developed "crochet" and "antecrochet," but no internal cingulum; the lower cheek-teeth have a distinct external cingulum.

Hab. Europe.

28845. Cast of the left half of the cranium, showing one incisor and six cheek-teeth. The original is from the Lower Miocene of Gannat (Allier), France, and is preserved in the Paris Museum of Natural History. It is described and figured

[1] See Journ. As. Soc. Beng. vol. xlix. pt. 2, p. 28 (1880).
[2] Genus *Diceratherium,* Marsh.
[3] Cope, Proc. Amer. Phil. Soc. vol. xix. p. 393 (1881); in the Amer. Nat. vol. xiii. p. 771*b* (1879), it was given as I. $\frac{2}{1}$, C. $\frac{0}{1}$.
[4] Ossemens Fossiles, 2nd ed. vol. ii. pt. i. p. 93 (1822).
[5] Foss. Säugeth. Württ. p. 69 (1835–39). Identified with this species in Kaup's 'Beiträge,' pt. 1, p. 1.
[6] Bull. Soc. Géol. France, sér. 2, vol. i. p. 591 (1844).
[7] Catalogue Méthodique, p. 78 (1853).
[8] Arch. d. Muséum, vol. vii. p. 42 (1854).
[9] Beiträge, 1st ed. pt. 1, p. 1 (1854).
[10] Amer. Nat. vol. xiii. p. 771*b* (1879).

by Duvernoy in the Arch. d. Muséum, vol. vii. p. 42, pl. i. fig. 2, and by Kaup in the 'Beiträge,' pt. 1, pl. viii.
Presented by the Paris Museum of Natural History, 1854.

M. 2739. Cast of the fourth right upper premolar. The original is from the Lower Miocene of the Mayence Basin, near Eppelsheim, Hessen-Darmstadt[1], and is figured (reversed) by Kaup in the Oss. Foss. d. Darmstadt, pt. 3, pl. xii. fig. 10. *Egerton Collection. Purchased*, 1882.

M. 2740. Cast of the first left upper true molar. The original is from the Lower Miocene near Eppelsheim, and is figured by Kaup, *op. cit.* pl. xii. fig. 9.
Egerton Collection. Purchased, 1882.

M. 2742. Cast of the second left upper true molar. The original is from the Lower Miocene near Eppelsheim, and is figured by Kaup, *op. cit.* pl. xii. fig. 8.
Egerton Collection. Purchased, 1882.

29656. A much-worn second left upper true molar; from a Lower Miocene deposit. *Hastings Collection. Purchased*, 1855.

1257. A well-worn third left upper true molar; from the Lower Miocene near Eppelsheim. *Purchased from Dr. Kaup.*

28846. Cast of the greater portion of the mandible, showing six cheek-teeth on the left side, and the alveoli of the incisor and canine of both sides. The original is from the Lower Miocene of Gannat, and is preserved in the Paris Museum of Natural History.
Presented by the Paris Museum of Natural History, 1854.

28847. Cast of the hinder part of the left ramus of the mandible, with the three true molars. The original is from the Lower Miocene of Gannat, and is preserved in the Paris Museum of Natural History. It is figured by Duvernoy in the Arch. d. Muséum, vol. vii. pl. i. fig. 2, and by Kaup in the 'Beiträge,' pt. 1, pl. viii.
Presented by the Paris Museum of Natural History, 1854.

[1] "A satisfactory geological limitation of the Eppelsheim deposit and its organic contents is attended with some difficulty. The loose incoherent sand of which it is composed is spread out horizontally like the Löss, and the margin thins out to spread over a portion of the Lower-Miocene Mayence Basin; so that where the beds are in contact the fossil remains of the two are liable to be confounded." ('Falconer's Palæontological Memoirs,' vol. ii. pp. 46, 47 [1868].)

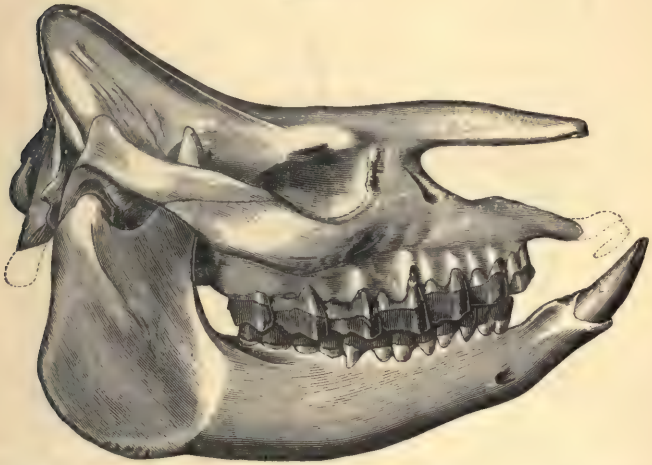
M. 2742. Cast of the fourth right lower premolar. The original is from the Lower Miocene of Weinsheim, Hessen-Darmstadt; and is figured by Kaup in the Oss. Foss. d. Darmstadt, pt. 3, pl. xii. fig. 11.

Egerton Collection. Purchased, 1882.

E. *Aceratherine Group.*

In this group there is no nasal horn, and the nasals are straight and flat. In the typical *R. incisivus* and some other European species there are four digits to the manus, but in others, as well as in the North-American forms (which have been generically separated), they are reduced to three. The number of cutting-teeth[1] is various, and may, according to Cope, be represented by the formula I. $\frac{(0-2)}{1}$, C. $\frac{0}{1}$.

Fig. 16.



Rhinoceros megalodus (Cope[2]).—Skull; from the Miocene (Loup Fork Beds) of Colorado. ⅛. (From the 'American Naturalist.')

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[1] For the dentition of the American forms see Cope, Proc. Amer. Phil. Soc. vol. xix. p. 393 (1881). In this memoir the formula of the so-called *Peraceras* is given as I. $\frac{0}{1}$, C. $\frac{0}{1}$; it was given in the Amer. Nat. vol. xiv. p. 540 (1880) as I. $\frac{0}{0}$, C. $\frac{0}{0}$, and is thus quoted in the 'Palæontologia Indica,' ser. 10, vol. ii. p. ix. (In note 1 the volume and sheet [xiv. 1880] are omitted.)

[2] Syn. *Aphelops megalodus*, Cope.

The skull of the American *R. megalodus* (Cope) is figured in the accompanying woodcut (fig. 16).

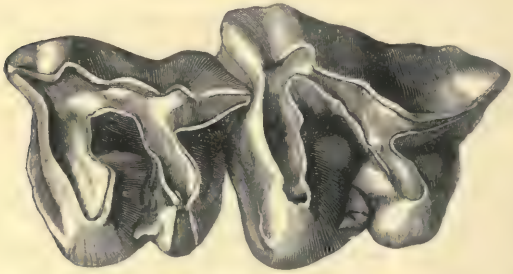
Rhinoceros croizeti (Filhol [1]).

Syn. (?) *Aceratherium croizeti*, Pomel [2].

Pomel's *A. croizeti* was described as being larger than *R. minutus*, whereas the specimens described by Filhol (*op. cit.*) indicate a form rather smaller [3] than Duvernoy's and Kaup's specimens of the latter. As Pomel's description is too vague to be of any value it is better to take the mandible figured by Filhol as the type; the latter is from St. Gérand-le-Puy, but it is stated that specimens from Quercy cannnot be specifically distinguished. The specimens in the Museum show that there was no "crochet" or inner cingulum in the upper true molars (fig. 17), nor any cingulum in the lower molars; $\overline{\text{pm. 1}}$ is persistent in the mandible figured by Filhol.

Hab. France.

Fig. 17.



Rhinoceros croizeti.—Upper true molars; from the Upper Eocene of Bach. ½.

M. 1732. (*Fig.*) Fragment of the left maxilla, containing $\underline{\text{m. 1}}$ and $\underline{\text{m. 2}}$ (woodcut, fig. 17); from the Upper-Eocene phosphorites of Bach, near Lalbenque (Lot), France. The length of $\underline{\text{m. 1}}$ is 0,034 and its width anteriorly 0,031, the corresponding dimensions of $\underline{\text{m. 2}}$ being 0,037 and 0,034.

Purchased, 1884.

M. 1729. Part of the mandible, showing $\overline{\text{m. 2}}$ and $\overline{\text{m. 3}}$ on the left side; from the Upper Eocene of Eschamps, near Lalbenque.

[1] Ann. Sci. Géol. vol. xi. art. 1, p. 1 (1880; vol. dated 1881); *Aceratherium*.
[2] Catalogue Méthodique, p. 77 (1853).
[3] Filhol says larger, but this is not borne out by his figures.

This specimen is slightly smaller than the one figured by Filhol, *op. cit.* pl. i., but is otherwise very similar; the length of $\overline{\text{m. 3}}$ is 0,030. *Purchased*, 1884.

M. 1785. Two lower cheek-teeth; from Bach. *Purchased*, 1884.

M. 1461. A third right lower true molar, provisionally referred to this species; from the Upper-Eocene phosphorites of Caylux (Tarn-et-Garonne), France. *Purchased*, 1884.

27766. Part of the right ramus of a mandible, provisionally referred to this species; from the Lower Miocene of Perrier (Puy-de-Dôme), France. This specimen shows the three true molars, the anterior crescent of $\overline{\text{m. 1}}$ being wanting. It is somewhat smaller than No. M. 1729, but agrees much more nearly with this than with *R. minutus*.
Croizet Collection. Purchased, 1848.

27667. An associated left astragalus and calcaneum, belonging either to this species or to *R. minutus*; from the Lower Miocene of Chaptuzat (Puy-de-Dôme).
Croizet Collection. Purchased, 1848.

M. 1846. An imperfect middle cervical vertebra, provisionally referred to this species; from Caylux. *Purchased*, 1884.

Rhinoceros occidentalis, Leidy [1].

Syn. *Aceratherium occidentale*, Cope [2].

This is a comparatively small species, in which the upper true molars have a strong "antecrochet," but no "crochet," while the premolars have a well-developed cingulum, of which there is a trace in the true molars. A cranium is figured by Leidy in the Journ. Ac. Nat. Sci. Philad. ser. 2, vol. vii. pl. xxii. (1869).

Hab. North America.

29677. Part of the right maxilla, containing the last four cheek-teeth, in a broken condition; from the Miocene of Nebraska, U.S.A. The teeth are somewhat smaller than those of the cranium figured by Leidy, but otherwise agree.
Purchased, 1855.

[1] Proc. Ac. Nat Sci. Philad. vol. v. p. 119 (1850; vol. dated 1852).
[2] Amer. Nat. vol. xiii. p. 771*c* (1879).

Rhinoceros cimogorrhensis, Lartet[1].

Rhinoceros simorrensis, Lartet[2].

This species is of rather small size, with canines of moderate development, there is an inner cingulum to pm. 2 and pm. 3, a crochet and antecrochet are developed in the upper true molars, and $\overline{\text{pm. 1}}$ is present. It is stated that a minute horn is present in some instances; the manus has but three digits.

Hab. France.

33525. The nearly complete cranium; from the Middle Miocene of Villefranche d'Astarac (Gers), France. The whole of the dentition is shown, and there is no trace of any protuberance for a horn. Noticed in 'Falconer's Palæontological Memoirs,' vol. ii. p. 361. The length of the space occupied by the seven teeth is 0,193. *Purchased*, 1858.

33525 a. The extremity of the nasals; from Villefranche d'Astarac. There is no trace of the attachment of any horn. *Purchased*, 1858.

33526. The greater portion of the two mandibular rami, showing all the cheek-teeth except $\overline{\text{pm. 1}}$; from Villefranche d'Astarac. *Purchased*, 1858.

29647. A left lower cheek-tooth; from the Middle Miocene of Simorre (Gers). *Hastings Collection. Purchased*, 1855.

The following specimens from Simorre are provisionally referred to this species. Purchased, 1858.

33542. An upper incisor.

33543. A pisiform.

33531. The right femur, imperfect proximally.

33532. A patella.

33544. The right calcaneum.

33545. The right astragalus.

33549. The left navicular.

33533–5. Three metapodials.

[1] In Laurillard's 'Dict. Univ. d'Hist. Nat.' vol. xi. p. 101 (1849).
[2] Notice sur la Colline de Sansan, p. 29 (1853).

Rhinoceros incisivus (Kaup[1]).

Syn. *Aceratherium incisivum*, Kaup[2].
Rhinoceros tetradactylus, Lartet[3].

As it seems doubtful what the *Rhinoceros incisivus* of Cuvier[4] (which according to Kaup[5] was founded on specimens from the Lower Miocene of Weissenau, near Mayence) really is, it appears advisable to take Kaup's Eppelsheim specimens as the type of the species. Gervais[6] identifies with this form the Middle Miocene *R. tetradactylus* of Lartet, but Gaudry[7] considers it distinct, and says the nasals are rather larger; this, however, may be merely a racial character, and in the absence of any other distinctive differences Gervais's view is provisionally adopted. Gaudry[8] provisionally refers to the Eppelsheim species some specimens from Pikermi, in which the canines are very large and closely approximated and the lower incisors absent. If this reference be correct the species ranged from the Middle Miocene to the Lower Pliocene[9].

Dentition:—Usually I. $\frac{2}{1}$, C. $\frac{0}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$; in the Pikermi form provisionally referred to this species the lower incisors are wanting. The upper cheek-teeth closely resemble those of *R. schleiermacheri*, but there is a slight external cingulum to the true molars, while the premolars have a strongly marked inner cingulum, and there is a small talon on the posterior surface of m. 3; pm. 4 has but two costæ. The lower canines are larger and curve more sharply upwards. The manus has four digits.

Hab. Europe.

M. 2788. Cast of the cranium and mandible. The original is from the Upper Miocene of Eppelsheim, Hessen-Darmstadt, and is figured by Kaup in the Oss. Foss. d. Darmstadt, pt. 3, pl. x. fig. 2. *Purchased.*

[1] Isis, 1832, p. 898; *Aceratherium.*
[2] *Loc. cit.*
[3] Notice sur la Colline de Sansan, p. 28 (1853). The name does not occur in 'Comptes Rendus,' vol. iv. p. 88 (1837).
[4] Ossemens Fossiles, 2nd ed. vol. ii. pt. i. p. 93 (1822).
[5] Oss. Foss. d. Darmstadt, pt. 3, p. 49 (1834); and 'Beiträge,' 1st ed. pt. i. p. 1 (1854).
[6] Zool. et Pal. Françaises, 2nd ed. p. 101 (1848–52).
[7] Les Enchaînements, &c.—Mamm. Tert. p. 47 (1878).
[8] *Ibid.* p. 51, fig. 46.
[9] Filhol (Ann. Sci. Géol. vol. viii. art. 1, p. 126) provisionally referred to *R. tetradactylus* certain specimens from the Quercy phosphorites; but it is more probable that they belong to *R. lemanensis* (*vide infrà*, p. 152).

M. 2744. Cast of the palate, showing the cheek-dentition of both sides. The original is from Eppelsheim and is figured by Kaup in the 'Beiträge,' pt. i. pl. iv., and the dentition of the left side in the Oss. Foss. d. Darmstadt, pt. 3, pl. xiv. fig. 5. *Purchased.*

M. 233. The left maxilla, showing the last six cheek-teeth; from Eppelsheim. The teeth show all the characteristic features of the species, but the cingulum of the premolars is not so strongly developed as in some specimens.
Enniskillen Collection. Purchased, 1882.

M. 236. Fragment of the right maxilla, containing pm. 4, m. 1, and m. 2; from Eppelsheim.
Enniskillen Collection. Purchased, 1882.

1258. The second and third left upper premolars; from Eppelsheim. The cingulum is very distinct.
Purchased from Dr. Kaup.

27464. Fragment of the left maxilla, containing the last three premolars; from Eppelsheim.
Hastings Collection. Purchased, 1855.

M. 2745. Cast of part of the right maxilla, containing the first three premolars. The original is from Eppelsheim, and is figured by Kaup in the Oss. Foss. d. Darmstadt, pt. 3, pl. xiv. fig. 6. *Egerton Collection. Purchased*, 1882.

21017 e. Fragment of the left maxilla, containing pm. 2 and part of pm. 3; from Eppelsheim.
Purchased from Dr. Kaup, 1847.

M. 251. Fragment of the right maxilla, containing mm. 4, m. 1, and m. 2; from Eppelsheim.
Egerton Collection. Purchased, 1882.

M. 240 a. Two specimens of the second upper premolar; from Eppelsheim. *Enniskillen Collection. Purchased*, 1882.

21017. Several specimens of the second upper premolar; from Eppelsheim. *Purchased from Dr. Kaup*, 1847.

1256. The second left upper premolar; from Eppelsheim.
Purchased from Dr. Kaup.

M. 2746. Cast of the second left upper premolar. The original is from Eppelsheim, and is figured by Kaup, *op. cit.* pl. xiv. fig. 7. *Egerton Collection. Purchased*, 1882.

21017 a. Several specimens of the third upper premolar; from Eppelsheim. All these teeth show a strong cingulum and two "costæ." *Purchased from Dr. Kaup*, 1847.

M. 2747. Cast of the third right upper premolar. The original is from Eppelsheim, and is figured by Kaup, *op. cit.* pl. xii. fig. 2, as *R. schleiermacheri*. In the presence of two "costæ" and a slight cingulum it agrees, however, with the present species. *Egerton Collection. Purchased*, 1882.

11837. Cast of the well-worn third right upper premolar. The original is from the Middle Miocene of Chevilly, near Orleans (Loiret), France.
Mantell Collection. Purchased, 1836.

21017 b. Several specimens of the fourth upper premolar; from Eppelsheim. *Purchased from Dr. Kaup*, 1847.

M. 2748. Cast of the fourth left upper premolar. The original is from Eppelsheim, and is figured by Kaup, *op. cit.* pl. xii. fig. 4, under the name of *R. schleiermacheri*; it agrees, however, in character with the preceding specimens, and differs from pm. 4 of the latter (No. 21484, page 125).
Purchased.

36991. The inner half of the fourth right upper premolar; from Eppelsheim. *Purchased*, 1861.

19441, 21017 c. Two upper true molars; from Eppelsheim.
Purchased from Dr. Kaup, 1845–47.

M. 237. The first or second left upper true molar; from Eppelsheim. *Enniskillen Collection. Purchased*, 1882.

M. 2749. Cast of the third left upper true molar. The original is from Eppelsheim, and is figured by Kaup, *op. cit.* pl. xiv. g. 8. *Egerton Collection. Purchased*, 1882.

M. 2370. The third right upper true molar; from Eppelsheim.
Enniskillen Collection. Purchased, 1882.

27466. The third left upper true molar; from Eppelsheim.
Hastings Collection. Purchased, 1855.

21017 d. Two third left upper true molars; from Eppelsheim.
Purchased from Dr. Kaup, 1847.

M. 470. The third left upper true molar; from Eppelsheim. This and the two following specimens are of small size.
Enniskillen Collection. Purchased, 1882.

19440. The third left upper true molar ; from Eppelsheim.
Purchased from Dr. Kaup, 1845.

11841. Cast of a third left upper true molar, provisionally referred to this species. The original is from Chevilly.
Mantell Collection. Purchased, 1836.

M. 2750. Casts of three upper incisors. The originals are from Eppelsheim and Oppenheim, and are figured by Kaup in the Oss. Foss. d. Darmstadt, pt. 3, pl. xiv. figs. 1–3.
Egerton Collection. Purchased, 1882.

11840. Cast of an upper incisor. The original is from Eppelsheim. *Mantell Collection. Purchased*, 1836.

M. 2751. Cast of the symphysis and the left ramus of the mandible. The original is from Eppelsheim, and is figured by Kaup, *op. cit.* pl. xiv. fig. 9. *Purchased.*

M. 2752. The symphysis, left and portion of the right ramus of the mandible; from Eppelsheim. On the right side $\overline{\text{pm. 1}}$ is *in situ*. *Purchased.*

M. 375. The symphysis and the left ramus of a mandible, provisionally referred to this species; from Eppelsheim. The form of the symphysis agrees with that of the cast No. M. 2751, but the alveoli for the canines are much smaller.
Egerton Collection. Purchased, 1882.

111 f. (O. C.). Cast of a lower canine. The original is from Eppelsheim. *Purchased.*

M. 239. A lower canine ; from Eppelsheim.
Enniskillen Collection. Purchased, 1882.

M. 253. A lower canine ; from Eppelsheim.
Egerton Collection. Purchased, 1882.

32517. Fragment of the right ramus of a mandible with two molars, provisionally assigned to this species; from the Middle Miocene of Sansan (Gers), France.
Tesson Collection. Purchased, 1857.

The following specimens, of which the originals came from Hessen-Darmstadt, are referred by Kaup to this species. Purchased.

M. 2753. Cast of the right magnum. Figured by Kaup in the Oss. Foss. d. Darmstadt, pt. 3, pl. xv. fig. 6.

1286. Cast of the left second metacarpal. Figured, *op. cit.* pl. xv. fig. 5.

M. 2754. Cast of the left fifth metacarpal. Figured, *op. cit.* pl. xv. fig. 4.

1287. Cast of the distal extremity of the right femur. Figured, *op. cit.* pl. xv. fig. 1.

1288. Cast of the right calcaneum. Figured, *op. cit.* pl. xv. fig. 11.

1289. Cast of the left calcaneum.

M. 2755. Cast of the right astragalus. Figured, *op. cit.* pl. xv. fig. 10.

1290. Cast of a smaller right astragalus. Figured, *op. cit.* pl. xv. fig. 2.

1291. Cast of the navicular, cuboid, and second and third metatarsals of the left side. Figured, *op. cit.* pl. xv. fig. 9.

M. 2756. Cast of the first phalangeal of a lateral digit. Figured, *op. cit.* pl. xv. fig. 8.

M. 2757. Cast of the second phalangeal of a lateral digit. Figured, *op. cit.* pl. xv. fig. 9, *e*.

M. 2758. Cast of the terminal phalangeal of a median digit. Figured, *op. cit.* pl. xv. fig. 7.

Several of the following specimens from the Red Crag have been described under the name of R. schleiermacheri, *but the strongly developed cingulum and the presence of only two costæ in the upper premolars renders it more probable that at least several of them belong to the present species.*

36561. (*Fig.*) The fourth right upper premolar; from Suffolk. Figured by Owen in the Quart. Journ. Geol. Soc. vol. xii. p. 231, fig. 1 (1856). *Purchased*, 1853.

M. 2759. (*Fig.*) The inner half of a right upper premolar; from Felixstowe, Suffolk. Figured by Owen, *op. cit.* p. 231, fig. 2. *Presented by George Ransome, Esq. Before* 1856.

48934. The fourth upper premolar; from Suffolk. *Purchased*, 1878

28251, 42023. The inner halves of two right upper premolars; from Suffolk. *Purchased*, 1852 *and* 1870.

28252, 48958. Two specimens of the outer lamina of right upper true molars; from Suffolk. *Purchased*, 1852 *and* 1878.

M. 2760. Three lower true molars; from Suffolk. Figured by (*Fig.*) Owen, *op. cit.* p. 232, figs. 4–6.
Purchased. Before 1856.

48959, 48960. Two right lower true molars; from Suffolk.
Purchased, 1878.

27856, 28245. Two right lower cheek-teeth; from Felixstowe.
Purchased, 1852.

35856. The second right lower true molar; from Suffolk.
Presented by J. Berners, Esq., 1861.

46570. Four lower cheek-teeth; from Woodbridge, Suffolk.
Purchased, 1878.

46494. The second left lower premolar; from Felixstowe.
Purchased, 1878.

Rhinoceros goldfussi, Kaup[1].

Syn. *Rhinoceros brachypus*, Lartet[2].
Aceratherium goldfussi, Kaup[3].
Aceratherium brachypus, Falconer[4].

This is a large species, with well-developed canines. The upper true molars have a well-developed crenulated cingulum on the inner surface, and a less distinct one externally; the "antecrochet" is strongly marked. There are three digits to the manus. The lower cheek-teeth have an incomplete external cingulum.

Hab. Europe.

33522. The upper cheek-teeth of the left side (wanting ___1), belonging to different individuals; from the Middle Miocene of Villefranche d'Astarac (Gers), France. Noticed in 'Falconer's Palæontological Memoirs,' vol. ii. p. 361.
Purchased, 1858.

[1] Oss. Foss. d. Darmstadt, pt. 3, p. 62 (1834).
[2] In Laurillard's 'Dict. Univ. d'Hist. Nat.' vol. xi. p. 101 (1849).
[3] Beiträge, 1st ed. pt. i. p. 1 (1854).
[4] Palæontological Memoirs, vol. ii. p. 361 (1868).

40743. The second right upper true molar; from the Middle Miocene of Sansan (Gers), France.
Presented by C. Falconer, Esq., 1867.

40744. The second left upper premolar; from Sansan.
Presented by C. Falconer, Esq., 1867.

27461. The third left upper true molar; probably from Sansan.
Hastings Collection. Purchased, 1855.

39921. A first and a second upper true molar, of opposite sides; from the Middle Miocene of Steinheim, Bavaria.
Purchased, 1866.

39921 a. The third right upper true molar; from Steinheim. This specimen agrees very closely with the one figured by Fraas in the 'Fauna von Steinheim,' pl. iii. fig. 8 (1870).
Purchased, 1866.

32526. The fourth right upper premolar; from the Middle Miocene of Touraine, France.
Tesson Collection. Purchased, 1857.

33524. An upper incisor; from Villefranche d'Astarac.
Purchased, 1858.

33523. The last five lower cheek-teeth of the right side; from Villefranche d'Astarac. These specimens belong to different individuals. *Purchased*, 1858.

27454. A nearly complete mandible, in a crushed condition, provisionally referred to this species; from Sansan. The teeth agree very closely with those of No. 33523.
Hastings Collection. Purchased, 1855.

40745. A right lower true molar; from Sansan.
Presented by C. Falconer, Esq., 1867.

32528. The third left lower true molar; from Touraine.
Tesson Collection. Purchased, 1857.

M. 2761. Cast of a left lower true molar. The original is from the Upper Miocene of Eppelsheim, Hessen-Darmstadt, and is figured by Kaup in the Oss. Foss. d. Darmstadt, pt. 3, pl. xi. fig. 13. *Egerton Collection. Purchased*, 1882.

M. 2762. Cast of a right lower true molar. The original is from Eppelsheim, and is figured by Kaup, *op. cit.* pl. xi. fig. 14.
Egerton Collection. Purchased, 1882

The following specimens are provisionally referred to this species.

32525. Fragment of the shaft of a humerus; from Touraine.
Tesson Collection. Purchased, 1857.

33527. The distal extremity of the left radius; from Villefranche d'Astarac. *Purchased*, 1858.

33537. The right cuneiform; from Gers. *Purchased*, 1858.

33528. A patella; from Villefranche d'Astarac. *Purchased*, 1858.

33530. The imperfect right calcaneum; from Villefranche d'Astarac. *Purchased*, 1858.

33529. The right astragalus; from Villefranche d'Astarac. In its transversely elongated form this specimen agrees with the one figured by Kaup in the 'Beiträge,' pt. i. pl. ix.
Purchased, 1858.

33538. A navicular; from Gers. *Purchased*, 1858.

33536. A metatarsal; from Gers. *Purchased*, 1858.

Rhinoceros lemanensis (Pomel[1]).

Syn. *Aceratherium lemanense*, Pomel[2].

This species is usually of rather larger size than *R. incisivus*; and is distinguished by the slight development of the "crochet," which is entirely wanting in half-worn teeth; there is a large "antecrochet." The upper premolars and the lower cheek-teeth have a strong cingulum; and there is an incomplete one in the upper true molars. A large *Rhinoceros* from the Quercy phosphorites has been provisionally identified by Filhol (Ann. Sci. Géol. vol. viii. art. 1, p. 126) with *R. incisivus* (*tetradactylus*); but the specimens in the Museum from the same deposits cannot be distinguished from the present species—a circumstance much more in harmony with the respective geological age of the two species.

Hab. France.

29624. Cast of the left upper cheek-dentition, in a half-worn condition. The original is from the Lower Miocene of the Auvergne, France; and is figured in De Blainville's 'Ostéographie,' genus *Rhinoceros*, pl. xii., as *R. incisivus* d'Auvergne. The length of the series of seven cheek-teeth is 0,260.
Presented by the Paris Museum of Natural History, 1854

[1] Catalogue Méthodique, p. 77 (1853), *Aceratherium* [2] *Loc. cit.*

47447. Fragment of the left maxilla of a young individual, showing mm. 3, mm. 4, and m. 1 (all imperfect); from the Lower Miocene of the Auvergne. There is small "crochet" in the unworn m. 1. *Croizet Collection.* *Purchased*, 1848.

M. 1455. Fragment of the right maxilla, containing m. 1 and m. 2; from the Upper Eocene phosphorites of Caylux (Tarn-et-Garonne), France. With the exception of being somewhat larger, these teeth agree precisely with those of No. 29624. *Purchased*, 1884.

34730. The hinder upper cheek-teeth of both sides of a small individual; from the Lower Miocene of Chaptuzat (Puy-de-Dôme), France. *Bravard Collection.* *Purchased*, 1852.

M. 1456. The unworn third left upper true molar; from Caylux. *Purchased*, 1884.

M. 1459. The first left upper premolar; from Caylux. This specimen agrees very closely with the corresponding tooth of No. 29624. *Purchased*, 1884.

M. 1458. Three lower true molars; from Caylux. *Purchased*, 1884.

M. 1457. Fragment of the left ramus of the mandible, containing pm. 4; from Caylux. *Purchased*, 1884.

M. 1460. The right lower canine; from Caylux. *Purchased*, 1884.

M. 1730. Fragment of the right ramus of the mandible, containing m. 2 and the first crescent of m. 3; from Caylux. The cingulum is very strongly developed. *Purchased*, 1884.

34721. Part of the right ramus of the mandible, showing the last four cheek-teeth; from the Lower Miocene of Antoin (Puy-de-Dôme). The development of the cingulum is much less strong than in No. M. 1730. *Bravard Collection.* *Purchased*, 1852.

34721 a. A right lower true molar; from the Lower Miocene of Puy-de-Dôme. *Bravard Collection.* *Purchased*, 1852.

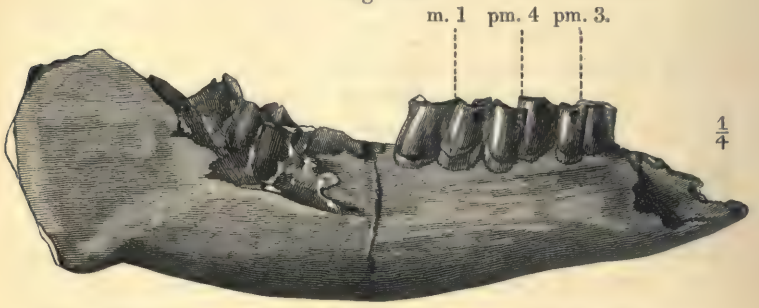
34741. A patella; from the Lower Miocene of Perignat (Puy-de-Dôme). *Bravard Collection.* *Purchased*, 1852.

Rhinoceros blanfordi, Lydekker[1].

Syn. *Aceratherium blanfordi,* Lydekker[2].

In this species the upper true molars have a "crochet," a very large "antecrochet," a slight "buttress," a tubercle at the entrance to the median valley, and an incomplete cingulum; in the premolars the cingulum is complete. An imperfect mandibular ramus is represented in the accompanying woodcut (fig. 18).

Fig. 18.



Rhinoceros blanfordi, Lyd.—The right ramus of the mandible of an immatur individual; from the Lower Siwaliks of the Búgti Hills, N.W. frontier of India. Indian Museum, Calcutta. (From the 'Palæontologia Indica.')

Hab. Persia[3], N.W. India, Baluchistan, and China. It was first recorded from the latter country by Koken[4], who designates the Chinese form as var. *hipparionum.*

28583. The first left upper true molar, in a well-worn condition from the Pliocene (?) of the south of China. This specimen agrees almost exactly with the slightly less worn m. 1 in the jaw figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. iii. pl. i. fig. 1; there are, however, three fossettes.

Presented by D. Hanbury, Esq., 1853.

28583 a. The inner half of the second right upper true molar; from China. This specimen agrees precisely with m. 2 in the figure quoted above.

Presented by D. Hanbury, Esq., 1853.

[1] Palæontologia Indica (Mem. Geol. Surv. Ind.), ser. 10, vol. iii. p. 2 (1884), *Aceratherium.* [2] *Loc. cit.*

[3] See a paper by the present writer on Persian Mammals (Quart. Journ. Geol. Soc. vol. xlii. 1886).

[4] Pal. Abhand. vol. iii. pt. 2, p. 18 (1885).

28583 b. The inner half of a smaller first right upper true molar; from China. This specimen agrees with m. 1 of a jaw figured by the present writer, *op. cit.* pl. ii. fig. 4.
Presented by D. Hanburg, Esq., 1853.

28583 c. A left lower cheek-tooth; from China.
Presented by D. Hanbury, Esq., 1853.

Rhinoceros perimensis, Falconer and Cautley [1].

Syn. *Aceratherium perimense*, Lydekker [2].
Rhinoceros iravadicus, Lydekker [3].
Rhinoceros planidens, Lydekker [4].

This species is of large size; the cranium is taller and shorter than in *R. incisivus*, with short pointed nasals. In the upper cheek-teeth the true molars (fig. 19) have a strong "buttress," a large "crochet," small "antecrochet," and an incomplete inner cingulum; in the premolars this cingulum is complete, and (as in the true molars) is frequently crenulated.

Hab. India (Perim Island, Punjab, and Siwalik Hills) and Burma.

M. 2725. Fragment of the right maxilla, containing pm. 2 and pm. 3, in a broken condition; from the Pliocene Siwaliks of Perim Island, Gulf of Cambay, India. The teeth agree precisely with those of the specimen figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pl. ii. *Transferred from the Old Indian Museum*, 1880.

18788. Anterior half of the first left upper true molar; from Perim Island. This tooth also agrees exactly with m. 1 of the figure cited. *Presented by Mrs. Leach*, 1845.

M. 2958. Cast of the second left upper true molar. The original (fig. 19) is from the Pliocene Siwaliks of Burma, and is preserved in the Indian Museum, Calcutta (No. C. 74 [5]); it is figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. i. pl. v. fig. 1 (under the name of *R. iravadicus*), and vol. iii. pl. i. fig. 5.
Made in the Museum, 1886.

[1] Fauna Antiqua Sivalensis, pt. 7, pl. lxxv. (1847).
[2] Palæontologia Indica (Mem. Geol. Surv. Ind.), ser. 10, vol. i. p. 51 (1876).
[3] *Ibid.* p. 36. [4] *Ibid.* p. 41.
[5] See Lydekker, Cat. Siwalik Vert. Indian Museum, Calcutta, pt. i. p. 66 (1885).

Fig. 19.

Rhinoceros perimensis.—The second left upper true molar, in a half-worn condition; from the Pliocene Siwaliks of Burma. ½.
Indian Museum, Calcutta.

M. 258. A much-damaged first or second right upper true molar; from Perim Island. *Purchased*, 1882.

M. 2726. The third right upper true molar; from Perim Island. Agrees very closely with m. 3, figured by the writer, *op. cit.* vol. ii. pl. iii. fig. 5.
Presented to the Old Indian Museum in 1847 *by A. Bettington, Esq., and transferred in* 1880.

M. 258 a. Fragment of the right maxilla of a young individual, containing mm. 3 and mm. 4; from Perim Island. The penultimate tooth agrees precisely with the one figured by the writer, *op. cit.* vol. ii. pl. iii. fig. 2. *Purchased*, 1882.

37256. A fourth left upper milk-molar, provisionally referred to this species; from Perim Island. See 'Palæontologia Indica,' ser. 10, vol. ii. pl. iii. fig. 2.
Presented by C. Falconer, Esq., 1867.

37257. Part of the symphysis and the right ramus of the mandible, containing $\overline{\text{pm.3}}$, $\overline{\text{pm.4}}$, $\overline{\text{m.1}}$, and $\overline{\text{m.2}}$, all much waterworn. This specimen agrees with the one figured by the writer, *op. cit.* vol. ii. pl. iv. *Presented by C. Falconer, Esq.*, 1867.

M. 2724. Fragment of the right ramus of the mandible, containing $\overline{\text{mm.4}}$, $\overline{\text{m.1}}$, and $\overline{\text{m.2}}$, all broken; from Perim Island. *Transferred from the Old Indian Museum*, 1880.

23150. The hinder part of the right ramus of the mandible, containing the three worn and broken true molars; from Perim Island. *Presented by Walter Ewer, Esq.*

M. 2722. Fragment of the left ramus of the mandible, containing the base of $\overline{\text{m.3}}$; from Perim Island. *No history.*

M. 2721. (*Fig.*) Hinder part of the left ramus of the mandible, containing the true molars, in a broken condition; from Perim Island. Figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. lxxvi. fig. 15. *No history.*

40693. Fragment of a mandible, with one broken premolar; from Perim Island. *Purchased*, 1867.

M. 258 b. An imperfect right lower true molar; from Perim Island. *Purchased*, 1882.

M. 258 c. The glenoidal extremity of the left scapula; from Perim Island. *Purchased*, 1882.

40833. The distal extremity of the left humerus; from Perim Island. *Presented by C. Falconer, Esq.*, 1867.

40694. The proximal half of a radius; from Perim Island. *Purchased*, 1867.

M. 2723. The acetabular portion of an innominate; from Perim Island. *No history.*

14755. (*Fig.*) The proximal extremity of the right femur; from Perim Island. Figured by Falconer and Cautley, *op. cit.* pl. lxxvi. fig. 16. *Presented by Miss Pepper. Before* 1846.

F. *Incertæ sedis.*

Rhinoceros, sp. *a.*

Hab. India.

48932. An imperfect cranium, showing some of the milk- and some of the permanent cheek-teeth (all broken); from the

Pliocene of the Siwalik Hills, India. This specimen is noticed by the writer in the 'Palæontologia Indica' (Mem. Geol. Surv. Ind.), ser. 10, vol. iii. p. 4; it apparently belongs to the aceratherine section, and is certainly distinct from *R. perimensis*, and apparently from *R. blanfordi*.

Presented by C. Falconer, Esq., 1867.

Rhinoceros, sp. *b*.

Hab. Tibet. The following specimens were obtained from the Upper Pliocene(?) of Húndes, in Western Tibet[1], and were brought by traders over the Niti pass: they are not specifically determinable[2], and belong to the Cautley Collection. *Presented*, 1842.

39653 a. Fragment of the right zygoma.

39653. (*Fig.*) The glenoidal portion of the right scapula. Figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. lxxvi. fig. 6.

39649. (*Fig.*) Fragment of the left humerus. Figured, *op. cit.* fig. 1.

39650. (*Fig.*) The proximal half of the left radius. Figured, *op. cit.* fig. 3.

39652. (*Fig.*) The left scaphoid. Figured, *op. cit.* fig. 2.

39656–7. (*Fig.*) The imperfect distal extremity of the left femur, and the proximal end of the tibia. Figured, *op. cit.* figs. 10, 4.

39654–5. (*Fig.*) A first and second phalangeal of a middle digit. Figured, *op. cit.* figs. 7, 8.

Genus **HYRACODON**, Leidy[3].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$.

On account of the presence of the full typical number of incisors, this genus is referred by Cope[4] to a separate family—*Hyracodontidæ*.

[1] See Lydekker, Rec. Geol. Surv. Ind. vol. xiv. pp. 178–184 (1881). These beds are provisionally classed in this notice as Pleistocene, but the writer now thinks they are more probably of Upper Pliocene age.

[2] It has been suggested in a paper by the present writer on Persian Mammals (Quart. Journ. Geol. Soc. vol. xlii. [1886]) that this form may be *R. blanfordi*.

[3] Proc. Ac. Nat. Sci. Philad. vol. viii. p. 91 (1856; vol. dated 1857).

[4] See Proc. Amer. Phil. Soc. vol. xix. pp. 379, 393 (1881).

There are apparently three digits to each foot, and there is no horn; the teeth are like those of *Rhinoceros*.

Hyracodon nebrascensis, Leidy [1].

Syn. *Rhinoceros nebrascensis,* Leidy [2].
Aceratherium nebrascense, Leidy [3].

This is the type species, and is about the size of *Tapirus indicus*.
Hab. North America.

29683. Fragment of the left maxilla, containing pm. 3, pm. 4, and portions of m. 1 and m. 2; from the Lower Miocene of the White River, Nebraska, U.S.A. *Purchased,* 1855.

44084. Fragment of the mandible with one imperfect cheek-tooth; from Nebraska. *Purchased,* 1873.

29679. The distal extremity of a humerus, perhaps belonging to this species; from Nebraska. *Purchased,* 1855.

The reference of the three following genera to the present family is provisional.

Genus **CADURCOTHERIUM,** P. Gervais [4].

The complete dental formula is unknown; the molars are rhinocerotic, but are extremely narrow in a transverse direction; the lower molars are imperfectly crescentoid.

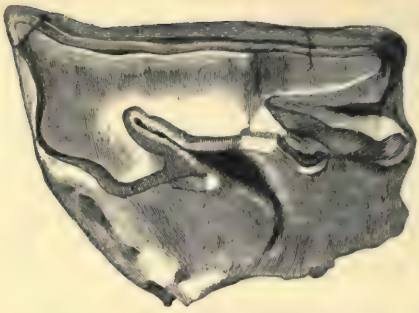
Cadurcotherium cayluxense, P. Gervais [5].

Hab. France.

M. 2419. (*Fig.*) **M. 2420.** Two specimens of left upper true molars, and two lower molars of opposite sides; from the Upper Eocene phosphorites of Caylux (Tarn-et-Garonne), France. These specimens (one of which is figured in the accompanying woodcut) agree with those figured by Gervais in the Zool. et Pal. Générales, sér. 2, pl. ix. (1876). *Purchased,* 1885

[1] Proc. Ac. Nat. Sci. Philad. vol. v. p. 121 (1850; vol. dated 1852); *Rhinoceros.*
[2] *Loc. cit.* [3] *Ibid.* vol. v. p. 331 (1852).
[4] Comptes Rendus, vol. lxxvii. p. 106 (1873).
[5] *Loc. cit.* Amended from *cayluxi*

Fig. 20.



Cadurcotherium cayluxense.—A left upper true molar; from the Upper Eocene of Caylux. ½.

M. 1731. Two upper and two lower true molars; from the Upper Eocene of Bach, near Lalbenque (Lot), France.

Purchased, 1884.

Genus **HOMALODONTOTHERIUM**, Huxley[1].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$. There is no diastema, and the dentition is of a generalized rhinocerotic character; the structure of the cheek-teeth being so like that obtaining in *Cadurcotherium* (although of a rather more complex type), that there can be little hesitation in placing the two genera in the same family, although the present genus is sometimes classed with *Nesodon*. No other portion of the skeleton is known.

Homalodontotherium cunninghami, Flower[2].

This is the only known species.

Hab. South America.

46295. The palate, showing all the dentition except the right m. 2 (*Fig.*) and m. 3; from Tertiary strata on the river Gallegas, south-east Patagonia. This and the next specimens are the types of the genus and species, and are described and figured by Flower in the Phil. Trans. for 1874, p. 173, pl. xvi.

Presented by R. O. Cunningham, Esq., M.D., 1874.

[1] Quart. Journ. Geol. Soc. vol. xxvi. p. lvii (1870).

[2] Phil. Trans. vol. clxiv. p. 173 (1874).

46296. The greater portion of the mandible, showing all the teeth; (*Fig.*) associated with the preceding specimen.

Presented by R. O. Cunningham, Esq., M.D., 1874.

Genus **ELASMOTHERIUM,** Fischer[1].

Dentition:—I. $\frac{?}{?}$, C. $\frac{?}{?}$, Pm. $\frac{2}{2}$, M. $\frac{3}{3}$. The skull is essentially rhinocerotic, but the cheek-teeth are taller than those of *Rhinoceros*, and thus approach those of the *Equidæ* and the *Toxodontia* (see J. F. Brandt, Mém. Ac. Imp. St. Pétersbourg, ser. 7, vol. viii. art. 4, 1864). The narial septum is ossified, and the frontals carry a large bony protuberance for the support of an immense horn.

Elasmotherium sibiricum, Fischer[2].

Syn. *Elasmotherium fischeri*, Desmarest[3].

Hab. Northern Europe.

M. 1890. Cast of the cranium, wanting several of the cheek-teeth. The original is from the Pleistocene of Nouvonsensk, Samara, Russia. *Purchased.*

M. 1891. Cast of an upper cheek-tooth. The original is from the Pleistocene of Nouvonsensk. *Purchased.*

Family CHALICOTHERIIDÆ.

The upper premolars are simpler than the true molars; the latter (fig. 21, p. 165) usually have four columns, of which the two hindmost are frequently connected by an oblique transverse ridge, and there may be a less complete anterior transverse ridge. The crowns of all the cheek-teeth are very low, and the upper ones when worn present V-shaped dentine surfaces; those of the lower jaw are crescentoid, and $\overline{\text{m.}3}$ has no third lobe. In the American forms there are four digits to the pes and three to the manus. The number of the cutting-teeth presents variations analogous to those obtaining in *Rhinoceros*. On these grounds, coupled with slight differences in the form of the cheek-teeth, a large number of genera have been founded[4]; at least all the Old-World forms are, however, included in the present work in the type genus.

[1] Program. Moscou, 1808; see also Mém. Soc. Imp. Nat. Moscou, vol. ii. p. 255 (1809).

[2] *Loc. cit.*

[3] Mammalogie, Supplement, p. 546 (1822).

[4] See Cope, Proc. Amer. Phil. Soc. vol. xix. p. 396 (1881).

Genus **CHALICOTHERIUM**, Kaup[1].

Including:—*Anisodon*, Lartet[2].
Nestoritherium, Kaup[3].

Dentition:—I. $\frac{(0-3)}{(0-3)}$, C. $\frac{(0-1)}{1}$, Pm. $\frac{3}{3}$, M. $\frac{3}{3}$. The two hinder cusps of the upper true molars are connected by a transverse ridge in the Old-World forms, although this may be very faint (*e. g. C. sivalense*[4]). In the closely allied North-American forms named *Palæosyops*, Leidy[5], and *Limnohyus*, Marsh, there are four premolars and the cross-ridges are absent; but as variations of at least equal importance occur in the upper molars of the different species of *Rhinoceros*, the writer is by no means assured of the advisability of their generic separation.

Chalicotherium goldfussi, Kaup[6].

Syn. *Chalicotherium antiquum*, Kaup[7].
Chalicotherium grande, Gervais[8].
Anisodon magnus, Lartet[9].

This is the type species, and is of large size; incisors and canines were present in both jaws. As it is difficult to draw any distinction between the type form and the smaller so-called *C. antiquum*, all the specimens are provisionally referred to one species.

Hab. Europe.

M. 2713. Cast of the third left upper true molar. The original is from the Upper Miocene of Eppelsheim, Hessen-Darmstadt, and is preserved in the Darmstadt Museum; it is the type, and is figured (reversed) by Kaup in the Oss. Foss. d. Darmstadt, pt. 2, pl. vii. fig. 3.

Egerton Collection. Purchased, 1882.

M. 2714. Cast of the second right upper true molar. The original is from Eppelsheim.

Egerton Collection. Purchased, 1882.

[1] Oss. Foss. d. Darmstadt, pt. 2, p. 4 (1833).

[2] Notice sur la Colline de Sansan, p. 30 (1851).

[3] Beiträge, pt. 4, p. 3 (1859).

[4] Cope, *op. cit.*, says that there is no transverse ridge in this species, for which he retains the name *Nestoritherium*.

[5] See 'Extinct Vert. Fauna, Western Territories' (Rep. U. S. Geol. Surv.), pl. iv.

[6] Oss. Foss. d. Darmstadt, pt. 2, p. 4 (1833).

[7] *Ibid.* p. 6.

[8] Zool. et Pal. Françaises, 1st ed. vol. i. p. 91 (1849–52).

[9] Notice sur la Colline de Sansan, p. 30 (1851).

M. 2715. Cast of the imperfect third left upper true molar. The original is from Eppelsheim.

Egerton Collection. Purchased, 1882.

M. 2716. Cast of a smaller third right upper true molar. The original is from Eppelsheim, and is figured by Kaup, *op. cit.* pl. vii. fig. 6, under the name of *C. antiquum*, of which it is the type.

Egerton Collection. Purchased, 1882.

M. 2717. Cast of the much-worn first left upper true molar. The original is from Eppelsheim.

Egerton Collection. Purchased, 1882.

40821. Cast of a fragment of the left maxilla, showing the last four cheek-teeth. The original is from the Middle Miocene of Sansan (Gers), France. The teeth correspond in size to Kaup's *C. antiquum*.

Presented by C. Falconer, Esq., 1867.

M. 2720. Cast of the third right upper premolar. The original is from Eppelsheim, and is figured by Kaup, *op. cit.* pl. vii. figs. 8, 9 (as a lower incisor [1]).

Egerton Collection. Purchased, 1882.

40821 a. Cast of a fragment of the left ramus of the mandible, showing $\overline{\text{pm. 4}}$, $\overline{\text{m. 1}}$, and $\overline{\text{m. 2}}$. The original is from Sansan, and belongs to Lartet's so-called *Anisodon magnus*.

Presented by C. Falconer, Esq., 1867.

M. 2719. Cast of a fragment of the left ramus of the mandible of an immature individual, showing three milk-molars. The original is from Eppelsheim.

Egerton Collection. Purchased, 1882.

M. 2718. Cast of the third left lower true molar. The original is from Eppelsheim, and is figured by Kaup, *op. cit.* pl. vii. fig. 5 (as $\overline{\text{m. 2}}$)[2]; it is of very large size.

Egerton Collection. Purchased, 1882.

21878. A first or second left lower true molar; from Sansan.

Croizet Collection. Purchased, 1848.

40764. A first or second left lower true molar; from Sansan.

Presented by C. Falconer, Esq., 1867.

[1] See 'Falconer's Palæontological Memoirs,' vol. i. p. 218 (1868).

[2] *Ibid.* p. 220.

Chalicotherium sivalense, Falconer and Cautley[1].

Syn. *Anoplotherium sivalense,* Falconer and Cautley[2].
Nestoritherium sivalense, Kaup[3].

Dentition:—I. $\frac{0}{0}$, C. $\frac{0}{1}$, Pm. $\frac{3}{3}$, M. $\frac{3}{3}$.

This species is equal in size to the smaller individuals of the preceding; the antero-internal column of the upper true molars is relatively larger, and the ridge connecting the two hinder columns shorter and lower. The species is the type of *Nestoritherium*.

Hab. India.

15366–7. (*Fig.*) The two halves of the palatal portion of the cranium, showing on the left side the last six, and on the right the last four cheek-teeth; from the Pliocene of the Siwalik Hills. This specimen is described and figured by Falconer and Cautley in the Proc. Geol. Soc. vol. iv. p. 235, pl. ii. figs. 1, 2 (1843); and is also figured in the 'Fauna Antiqua Sivalensis,' pl. lxxx. figs. 2, 3, and in 'Falconer's Palæontological Memoirs,' vol. i. pl. xvii. figs. 1, 2.
Cautley Collection. Presented, 1842.

M. 2710. Cast of the anterior portion of the cranium, with the mandible attached. The original is from the Siwalik Hills, and is preserved in the Museum of Mareschal College, Aberdeen; it is described by Falconer and Cautley, *op. cit.*, and is figured in the 'Fauna Antiqua Sivalensis,' pl. lxxx. fig. 1, and in 'Falconer's Palæontological Memoirs,' vol. i. pl. xvii. figs. 3–5. *No history.*

36734. (*Fig.*) Part of the symphysis and the left ramus of the mandible of an immature individual, showing the last four cheek-teeth; from the Siwalik Hills. Described by Falconer and Cautley, *op. cit.*, and figured *op. cit.* pl. lxxx. fig. 4, and xvii. figs. 6, 7. *Cautley Collection. Presented,* 1842.

M. 2711. (*Fig.*) An axis vertebra, provisionally referred to this species; from the Siwalik Hills. Figured (without determination) by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. lxxxiii. fig. 13.
Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

[1] Trans. Geol. Soc. ser. 2, vol. v. p. 502 (1837); *Anoplotherium.*
[2] *Loc. cit.*
[3] Beiträge, pt. 4, p. 3 (1859).

M. 2712. (*Fig.*) The distal extremity of a right femur, provisionally referred to this species; from the Siwalik Hills. Figured (without determination) by Falconer and Cautley, *op. cit.* pl. lxxxiii. fig. 4.

Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

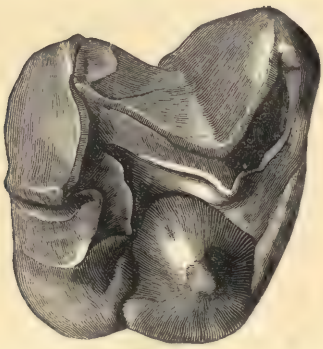
Chalicotherium sinense, Owen [1].

This species is known only by two upper molars, which are rather larger than those of *C. sivalense*, and present certain differences which are regarded as of specific value (see Koken, Pal. Abhand. vol. iii. pt. 2, p. 17 [1885]). Till the anterior dentition is known its full affinity cannot be determined.

Hab. China.

41934. (*Fig.*) The third right upper true molar, in an early condition of wear; from a cavern near Chung-king-foo, Sechuen, N.W. China. This specimen (woodcut, fig. 21) is the type, and

Fig. 21.



Chalicotherium sinense.—The third right upper true molar; from the Pliocene (?) of China. ½.

is described and figured by Owen in the Quart. Journ. Geol. Soc. vol. xxvi. p. 429, pl. xxix. figs. 7–10.

Purchased from R. Swinhoe, Esq., 1870.

[1] Quart. Journ. Geol. Soc. vol. xxvi. p. 429 (1870).

Family MACRAUCHENIIDÆ.

Of this family only the type genus is at present known, and the characters of the latter may therefore be taken as those of the former[1].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$.

The cheek-teeth are rhinocerotine, the upper true molars presenting two external V's and two transverse crests; there is only a very short diastema in the upper jaw. The cervical vertebræ resemble those of the *Camelidæ* in the position of the vertebrarterial canal, but the extremities of their centra are flat. The fibula articulates with the calcaneum (a character not known in any other Perissodactyle); and there are three digits to each foot, the lateral digits being of large size. Schlosser[2] regards the structure of the limbs as extremely primitive, and the dentition as more specialized.

Genus **MACRAUCHENIA,** Owen[3].

Macrauchenia patachonica, Owen[4].

This is the type species.

Hab. South America.

19950. The greater part of the left ramus of the mandible, showing (*Fig.*) all the cheek-teeth except $\overline{\text{pm. 1}}$; from the Pleistocene of Buenos Ayres. Described and figured by Owen in his 'Odontography,' p. 35, pl. cxxxv. fig. 7, and in the Phil. Trans. for 1870, p. 79, pl. viii. figs. 1–3.

Purchased, 1846.

43247. The distal half of the right humerus; from the Pleistocene of Buenos Ayres.

Presented by Señor L. J. Fontana, 1871.

M. 2706. Cast of the right metacarpals and many of the phalangeals. The original of these and the other casts are the type specimens, and are preserved in the Museum of the Royal College of Surgeons; they were obtained from the Pleistocene of Port St. Julian, Patagonia, and are described and figured in the 'Voyage of the Beagle.'

Presented by the Royal College of Surgeons.

[1] See Burmeister, 'Descripcion de la *Macrauchenia patachonica*' (Buenos Ayres, 1864).

[2] Zool. Anzeig. no. 210, 1885.

[3] Zoology of H.M.S. 'Beagle,' pt. i. p. 35 (1840).

[4] *Loc. cit.*

M. 2707. Cast of the right femur.
Presented by the Royal College of Surgeons.

43233. The distal half of the left femur; from the Pleistocene of Buenos Ayres. *Presented by Señor L. J. Fontana*, 1871.

40085. The right calcaneum; from the Pleistocene of Buenos Ayres. *Purchased*, 1860.

M. 2708. Cast of the right astragalus.
Presented by the Royal College of Surgeons.

M. 2709. Cast of a middle cervical vertebra.
Presented by the Royal College of Surgeons.

The serial position and the right to distinction of the three following Suborders is provisional, and subject to future revision.

Suborder *TOXODONTIA.*

The members of this group, which is provisionally regarded as of subordinal value, present extremely generalized characters. Thus *Nesodon* shows indications of affinity with the Perissodactyla by its dentition; *Toxodon* is related to the Artiodactyla by its cranium, and with the Proboscidea, and perhaps Amblypoda, by its foot-structure; while *Typotherium* has considerable resemblance to a rodent. The femur of *Toxodon* has no third trochanter, and the fibula articulates with the calcaneum. Cope [1] suggests affinity with the Condylarthra and Hyracoidea, the structure of the carpus being apparently similar (*vide infrà*, p. 172).

Family TOXODONTIDÆ.

Genus **NESODON**, Owen [2].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$. The dentition of this genus connects *Toxodon* with *Homalodontotherium* and *Macrauchenia*. The incisors have short crowns, and the true molars a complex, rhinoceroid structure. The limb-bones are unknown. Four species are recognized by H. Gervais and Ameghino [3].

[1] Proc. Amer. Phil. Soc. vol. xx. p. 444 (1882).
[2] Rep. Brit. Assoc. for 1846, p. 66 (1847).
[3] Mammifères Fossiles de l'Amérique Méridionale, pp. 105–107 (1880).

Nesodon ovinus, Owen[1].

This is the smallest species of the genus.

Hab. S. America.

35683. (*Fig.*) The cranium, imperfect posteriorly; from the Tertiary of the south-east of Patagonia. This and the next specimen are the types of the species, and are described and figured by Owen in the Phil. Trans. for 1853, p. 291, pls. xv., xvi.

Presented by Admiral Sir B. J. Sulivan, K.C.B., 1853.

35684. (*Fig.*) The right ramus of the mandible, associated with the preceding. Described and figured by Owen, *op. cit.*

Presented by Admiral Sir B. J. Sulivan, K.C.B., 1853.

Genus **TOXODON**, Owen[2].

Dentition:—I. $\frac{2}{3}$, C. $\frac{0}{1}$, Pm. $\frac{4}{3}$, M. $\frac{3}{3}$. All the teeth grow from persistent pulps; the lower canines are minute, the incisors large, and the crowns of the latter and of the cheek-teeth strongly curved. The structure of the cheek-teeth is a simplification of the plan obtaining in *Nesodon*. The characters of the base and hinder part of the cranium agree very closely with those of the *Suidæ*. Five species are recognized by H. Gervais and Ameghino[3].

Toxodon platensis, Owen[4].

Syn. *Toxodon angustidens*, Owen[5].

This is the type species, and is nearly equal in size to *Hippopotamus amphibius*.

Hab. South America.

49197. The cranium, wanting many of the teeth; from the Pleistocene of Buenos Ayres. *Purchased*, 1878.

19948. The anterior extremity of the cranium, wanting all the teeth except the outer left incisor; from the Pleistocene of Buenos Ayres. *Purchased*, 1846.

19949. The mandible, wanting many of the cheek-teeth; from the Pleistocene of Buenos Ayres. *Purchased*, 1846.

[1] Phil. Trans. vol. cxliii. p. 291 (1853).
[2] Zool. of Voyage of H.M.S. 'Beagle,' pt. 1, p. 16 (1840).
[3] Les Mammifères Fossiles de l'Amérique Méridionale, pp. 81–85 (1880).
[4] *Loc. cit.*
[5] Rep. Brit. Assoc. for 1846, p. 65 (1847).

39378. The hinder part of the right ramus of the mandible, containing the three true molars; from the Pleistocene of the Rio Negro, Uruguay.
Presented by D. A. Stoddart, Esq., 1865.

43238. The right upper inner incisor; from the Pleistocene of Buenos Ayres. *Presented by Señor L. J. Fontana*, 1871.

49197 a. The right upper inner incisor: from the Pleistocene of Buenos Ayres. *Purchased*, 1878.

49197 c. The base of an incisor, associated with the cranium No. 49197. *Purchased*, 1878.

39380. Fragment of an incisor; from the Pleistocene of the Rio Negro. *Presented by D. A. Stoddart, Esq.*, 1865.

39379. The imperfect extremity of the left inner upper incisor; from the Pleistocene of the Rio Negro.
Presented by D. A. Stoddart, Esq., 1865.

40494. Portion of an upper incisor; from the Pleistocene of Uruguay. *Presented by W. G. Lettsom, Esq.*, 1868.

43238. The enamel of an incisor; from the Pleistocene of Buenos Ayres. *Presented by Señor L. J. Fontana*, 1871.

19956. The first and second left upper true molars; from the Pleistocene of Buenos Ayres. *Purchased*, 1846.

49197 b. The third right upper true molar; from the Pleistocene of Buenos Ayres. *Purchased*, 1878.

43239. The left femur; from the Pleistocene of Buenos Ayres.
Presented by Señor L. J. Fontana, 1871.

43240. Part of the proximal extremity of the left femur; from the Pleistocene of Buenos Ayres.
Presented by Señor L. J. Fontana, 1871.

49198. The distal half of the left femur; from the Pleistocene of Buenos Ayres. *Purchased*, 1846.

Family TYPOTHERIIDÆ.

Genus **TYPOTHERIUM,** Bravard [1].

Syn. *Mesotherium,* Serres [2].

Dentition:—I. $\frac{1}{2}$, C. $\frac{0}{0}$, Pm. $\frac{2}{1}$, M. $\frac{3}{3}$. The incisors grow from persistent pulps; and the structure of the cheek-teeth recalls that of

Fig. 22.

Typotherium cristatum.—Cranium and mandible; from the Pleistocene of South America. $\frac{1}{3}$.

Toxodon. The skull is ungulate; there is a third trochanter to the femur, and clavicles are present; the astragalus has a distal ball-like articular condyle. A figure of the skull is given in the accompanying woodcut.

[1] Comptes Rendus, vol. xliv. p. 961 (1857). Quoted by Serres.
[2] *Ibid.* vol. xliv. p. 961 (1857).

Typotherium cristatum (Serres [1]).

Syn. *Mesotherium cristatum*, Serres [2].

Hab. South America.

33797. The middle portion of the cranium, showing two of the true molars; from the Pleistocene of Buenos Ayres.
Bravard Collection. Purchased, 1854.

33798. The occipital portion of the cranium; from Buenos Ayres.
Bravard Collection. Purchased, 1854.

49199. Two portions of the cranium; from the Pleistocene of S. America. *Presented by Sir R. Owen, K.C.B.*, 1878.

33801. Fragment of the palate; from Buenos Ayres.
Bravard Collection. Purchased, 1854.

49200. The greater part of the mandible, showing the dental alveoli; from South America.
Bravard Collection. Purchased, 1854.

33802. The anterior part of the mandible of a young individual, with one uninjured cheek-tooth; from Buenos Ayres.
Bravard Collection. Purchased, 1854.

33799. The inferior portion of the right ramus of the mandible; from Buenos Ayres. *Bravard Collection. Purchased*, 1854.

33800. The third right lower true molar; from Buenos Ayres.
Bravard Collection. Purchased, 1854.

All the following specimens are from the Pleistocene of Buenos Ayres, and belong to the Bravard Collection.

33842. Portions of the pelvis.

33843–4–6–7. The left femur, patella, tibia, and fibula.

33845, 33874–5. The left patella, and portions of the tibia and fibula.

33854–8, 33872–3, 6. Eight bones of the left pes.

33848, 33850–1–2–5. Five bones of the right pes.

33861–70. Numerous phalangeals.

33803–10. Eight associated dorsal vertebræ.

33813. The imperfect sacrum.

33814–9. Five caudal vertebræ.

33828–39. Several ribs.

[1] Comptes Rendus, vol. lxv. p. 142 (1867), *Mesotherium*. [2] *Loc. cit.*

Suborder *CONDYLARTHRA.*

The primitive mammals forming this Suborder are grouped by Cope[1] with the Hyracoidea and perhaps the Toxodontia in a division termed Taxeopoda, which is characterized by the scaphoid of the carpus being supported by the trapezoid and not by the magnum, the latter supporting the lunar; in the tarsus the cuboid articulates proximally with the calcaneum only. The component bones of both the carpus and tarsus mutually interlock only to a very slight extent; and the whole structure of these parts is the simplest type obtaining in the Ungulata. The present Suborder is characterized by a bunodont or (in the higher forms) a lophodont type of cheek-dentition, the characters of which foreshadow those of both the Artiodactyla and Perissodactyla: there are usually five digits to both the pes and manus, the terminal phalangeals being acuminate; the humerus has an ectepicondylar foramen, the astragalus a uniformly convex distal articular surface, the femur a third trochanter, and there are no fibular facettes on either the astragalus or the calcaneum. The skeleton of the type genus of the family *Phenacodontidæ* is figured in the accompanying woodcut (fig. 23); and apparently indicates a primitive form allied to *Hyracotherium.*

Family PERIPTYCHIDÆ.

The dentition is bunodont; the digits five on each foot; the astragalus has no trochlea; and the premolars are simple.

Genus **PERIPTYCHUS,** Cope[2].

Syn. *Catathlæus,* Cope[3].

Dentition:—I. $\frac{(2-3)}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$. The upper true molars have external accessory cusps, but these are not present in the lower true molars. The lower canines are of small size and the incisors small[4].

[1] Proc. Amer. Phil. Soc. vol. xx. p. 444 (1882), and Amer. Nat. vol. xviii. pp. 791–805 (1884). See also Schlosser, Zool. Anzeig., No. 210 (1885).

[2] Amer. Nat. vol. xv. p. 337 (1881).

[3] *Ibid.* vol. xv. p. 829 (1881).

[4] The genus was at first referred by its founder to the Creodonta=Carnivora Primigenia (*suprà*, Part I.).

Fig. 23.

Phenacodus primævus, Cope.—Skeleton; from the Wasatch Eocene of Wyoming, U.S.A. ¼. (From the Amer. Nat.)

Periptychus rhabdodon, Cope [1].

Syn. *Catathlæus rhabdodon*, Cope [2].

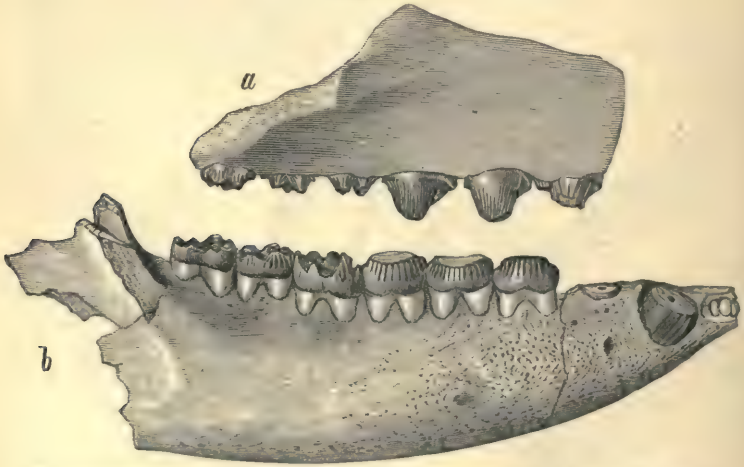
This species is of considerable size, and is characterized by the grooved and ridged sculpture of the teeth. The dentition is represented in the accompanying woodcuts (figs. 24, 25).

Hab. North America.

Fig. 24.

Periptychus rhabdodon.—Upper (*a*) and lower (*b*) cheek-dentition, grinding surface; from the Puerco Eocene of New Mexico. $\frac{2}{3}$. (From the Amer. Nat.)

Fig. 25.



Periptychus rhabdodon.—Lateral view of the upper (*a*) and lower (*b*) cheek-dentition of the specimen represented in fig. 24. $\frac{2}{3}$. (From the Amer. Nat.)

[1] Amer. Nat. vol. xv. p. 830 (1881), *Catathlæus.* [2] *Loc. cit.*

M. 2569. Fragment of the right maxilla, containing the last five cheek-teeth; from the Puerco Eocene of New Mexico. The premolars are well worn.

Presented by R. Lydekker, Esq., 1885.

M. 2569 a. Two fragments of mandibular rami, one showing pm. 3, pm. 4, m. 1, and m. 3, and the other the premolars and the broken bases of the cutting-teeth; from New Mexico.

Presented by R. Lydekker, Esq., 1885.

Genus **HAPLOCONUS**, Cope [1].

Dentition:—I. $\frac{?}{?}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$. The upper true molars have three main cusps arranged in a V-shape, and an accessory postero-internal cusp. The fourth upper premolar has an inner lobe, the others being simple.

Haploconus lineatus, Cope [2].

This is the type species; the premolars are larger than the true molars.

Hab. North America.

M. 2570. Fragment of the right maxilla, showing all the cheek-teeth except pm. 1; from the Puerco Eocene of New Mexico. The specimen agrees precisely with the one figured by Cope in the Amer. Nat. vol. xviii. p. 804, fig. 13 (1884). *Presented by R. Lydekker, Esq.*, 1885.

M. 2570 a. Fragment of the left ramus of the mandible, with m. 2 and m. 3; from New Mexico.

Presented by R. Lydekker, Esq., 1885.

Suborder *AMBLYPODA* [3].

In this Suborder the carpus is characterized by the scaphoid being supported by the trapezoid and not by the magnum, while the latter and the unciform support the lunar; in the tarsus the cuboid articulates proximally with both the calcaneum and the astragalus.

[1] Amer. Nat. vol. xvi. p. 417 (1882).

[2] *Loc. cit.*

[3] See Cope, Proc. Amer. Phil. Soc. vol. xx. p. 444 (1882); see also Amer. Nat. vol. xviii. pp. 1110–1121, 1192–1202 (1884), and xix. pp. 40–55 (1885). The name Amblydactyla was substituted by Marsh ('Monograph of the Dinocerata,' pp. 173, 193, U. S. Geol. Surv. vol. x. [1884]), but Cope (Amer. Nat. vol. xix. p. 704 [1885]) regards this as unnecessary.

The carpus is therefore of a more primitive structure than the tarsus. Both the carpal and tarsal bones interlock to a slight extent; the astragalus is flat; the feet plantigrade, short, and provided with five digits; the fibula articulates with the calcaneum. The brain is very small. The cheek-dentition is of a primitive lophodont type, the crowns of all these teeth being very short, and the upper true molars and the hinder premolars bearing two main oblique transverse ridges, which usually form one or two V's. Upper and lower canines are always present.

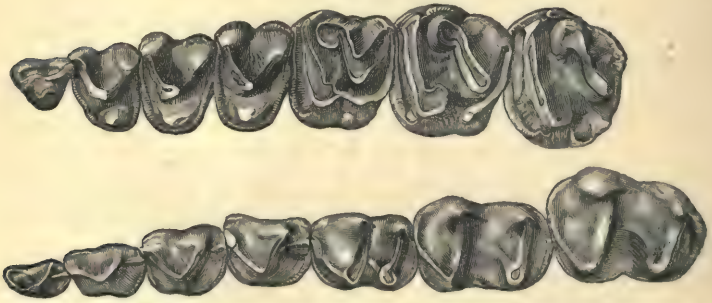
Section CORYPHODONTIA.

This section (Pantodonta of Cope[1]) is distinguished by the presence of upper incisors, and a third trochanter to the femur; and the absence of a head to the astragalus. There are no protuberances on the cranium; and the development of the upper canines is not excessive.

Family CORYPHODONTIDÆ.

The upper premolars are simpler than the true molars, and there are frequently two V's in the latter; in the lower molars there are two transverse ridges, of which the anterior gives off a process, so as to form a distinct V, with the angle pointing outwards (see woodcut, fig. 26). Numerous genera have been established[2].

Fig. 26.



Coryphodon hamatus, Marsh.—The left upper and lower cheek-dentition; from the Eocene of North America. ½. (From Marsh's 'Monograph of the Dinocerata.')

[1] See Proc. Amer. Phil. Soc. vol. xx. p. 445 (1882). The adopted name was applied by Marsh.

[2] See Amer. Nat. vol. xviii. p. 1194 (1884).

Genus **CORYPHODON,** Owen[1].

This is the type genus, and is represented by numerous species in the Lower Tertiaries of Europe and North America. As defined by Cope, it is characterized by the presence of a posterior V on the cro w of the upper true molars, and by the astragalus being transversely extended with an inner hook but no facet. The cranium of one of the American species is figured in the accompanying woodcut (fig. 27).

Fig. 27.

Coryphodon elephantopus, Cope.—Cranium viewed from the palatal aspect; from the Wasatch Eocene of New Mexico, U.S.A. $\frac{2}{5}$. (From the Amer. Nat.)

[1] British Fossil Mammals and Birds, p. 299 (1846).

Coryphodon eocænus, Owen[1].

Syn. *Lophiodon anthracoideum*, Blainville[2].
Coryphodon anthracoideum, Gervais[3].

This is the type species, and is of large size.

Hab. Europe.

32368, 69, 70, 75, 77, 78, 80. Casts of eight upper cheek-teeth. The originals are from the Lower Eocene of Soissons (Aisne), France, and with the other specimens from the same locality are described and figured by the donor in the Ann. Sci. Nat. sér. 4, vol. vi. p. 87, pls. iii., iv. (1856).
Presented by M. Hébert, 1857.

32371. Cast of the crown of the right upper canine. The original is from Soissons. *Presented by M. Hébert*, 1857.

32371 a, 72. Casts of two upper incisors. The originals are from Soissons. *Presented by M. Hébert*, 1857.

27848. (*Fig.*) Fragment of the right ramus of the mandible, containing $\overline{m.2}$; dredged on the Essex coast between St. Osyth and Harwich, and probably derived from the London Clay. This specimen is the type of the genus, and is described and figured in Owen's 'British Fossil Mammals and Birds,' p. 299, figs. 103, 107.
Presented by John Brown, Esq., 1852.

32364, 65, 74, 76. Casts of several lower cheek-teeth. The originals are from Soissons. *Presented by M. Hébert*, 1857.

32381. Cast of a lower canine; the original is from Soissons.
Presented by M. Hébert, 1857.

32383. Cast of the left femur; the original is from Meudon, near Paris, and is figured by the donor, *op. cit.* pl. iv. fig. 13.
Presented by M. Hébert, 1857.

44143. The imperfect distal half of the right femur; from the Lower Eocene near Dulwich, Surrey. *Purchased*, 1872.

32382. Cast of the proximal part of a radius; the original is from Soissons, and is figured by the donor, *op. cit.* pl. iv. fig 14.
Presented by M. Hébert, 1857.

M. 22. The centrum of a dorsal vertebra; from the London Clay of the Isle of Sheppey. *Purchased*, 1879.

[1] British Fossil Mammals and Birds, p. 299 (1846).
[2] 'Ostéographie,' Genus *Lophiodon*, p. 117 (1846).
[3] Zool. et Pal. Françaises, 2nd ed. p. 128 (1849–52).

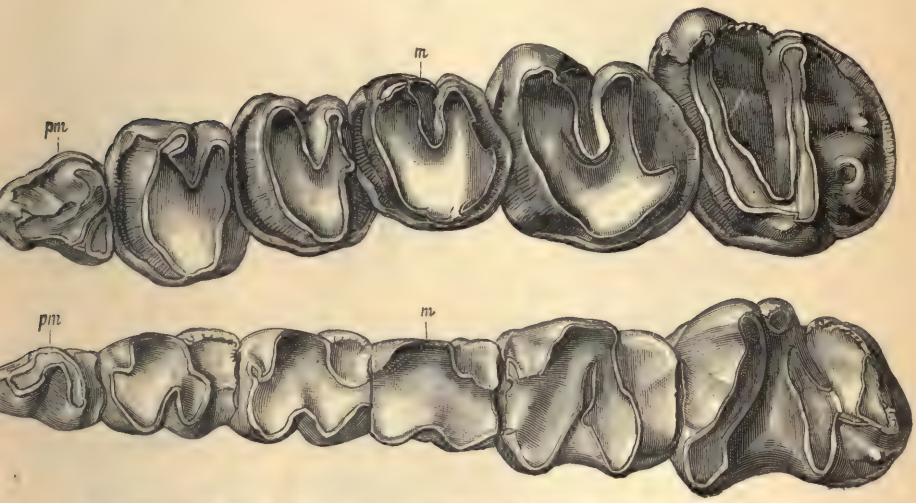
Section DINOCERATA.

The superior incisors are absent, and there is no third trochanter to the femur. The cranium carries several pairs of large protuberances; the upper canines of the males are of large size, and are frequently protected by a descending mandibular flange [1].

Family UINTATHERIIDÆ.

This is the only family at present known. The hinder upper premolars are as complex as the true molars (woodcut, fig. 28), and

Fig. 28.



Tinoceras stenops, Marsh.—The left upper and lower cheek-dentition; from the Eocene of North America. $\frac{3}{4}$. (From Marsh's 'Monograph of the Dinocerata.')

there is no distinct third lobe to $\overline{\text{m. 3}}$; in the last five upper cheek-teeth the two transverse ridges unite on the inner border of the crown to form a single V; a very similar V, with the angle directed inwards, occurring in the corresponding lower teeth. According to Marsh [2] there are always three lower incisors, but Cope states [3] that in some members of the type genus *Uintatherium* (in which Cope includes *Dinoceras*) they are reduced to two or even one. In the present Catalogue the generic divisions adopted by Marsh are provisionally accepted, although it seems very doubtful whether their differences are more important than those between the different groups of the genus *Rhinoceros*.

[1] For other characters see Marsh. 'Monograph of the Dinocerata' (U.S. Geol. Surv. vol. x. [1884]).

[2] *Op. cit.* pp. 41, 191.

[3] Amer. Nat. vol. xix. pp. 44, 53 (1885).

Genus **TINOCERAS**, Marsh [1].

Including :—*Eobasileus*, Cope [2].
Loxolophodon, Cope [3].

Dentition :—I. $\frac{0}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{3}$, M. $\frac{3}{3}$. The base of the upper canine

Fig. 29.

Tinoceras cornutum (Cope) [4].—The skull; from the Bridger Eocene of Wyoming, U.S.A. $\frac{1}{8}$. (From the 'American Naturalist.')

[1] Amer. Journ. ser. 3, vol. iv. p. 322 (for Oct., but published in advance on Aug. 19, 1872). Marsh's generic nomenclature is followed in this work, although Cope (Amer. Nat. vol. xix. p. 704 [1885]) states that some of the names should be changed.

[2] Proc. Amer. Phil. Soc. vol. xii. p. 485 (for Oct., but published in advance Aug. 20, 1872; vol. dated 1873).

[3] *Ibid.* p. 487 (same date).

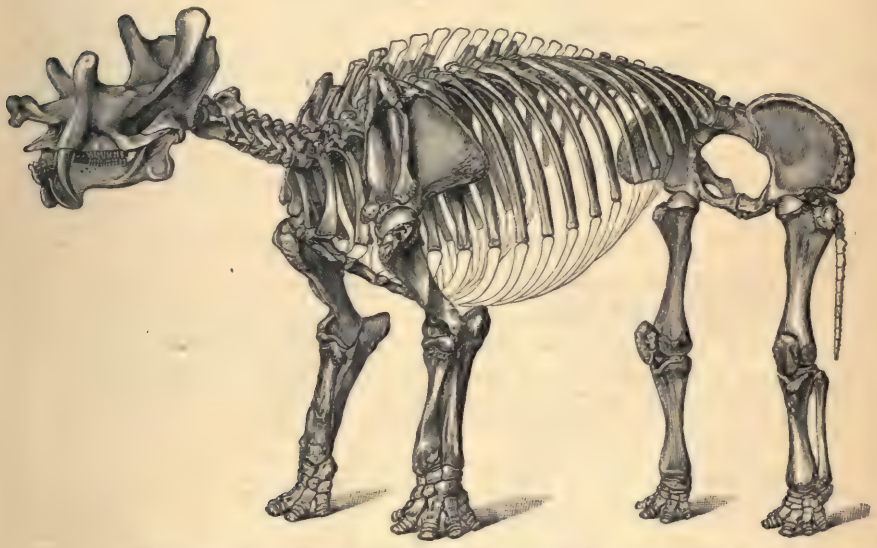
[4] Syn. *Loxolophodon cornutus*, Cope.

is horizontal, the cervical vertebræ short, and the lunar does not articulate with the trapezoid; the mandibular flange in some forms (woodcut, fig. 29) is almost absent; the fronto-parietal protuberances are frequently of large size (woodcut, fig. 29).

Tinoceras ingens, Marsh [1].

Hab. North America.

Fig. 30.



Tinoceras ingens.—The restored skeleton; from the Bridger Eocene of Wyoming, U.S.A. $\frac{1}{10}$. (From the 'American Journal.')

M. 2061. Cast of the cranium. The original is from the Bridger Eocene of Wyoming, U.S.A.; and is figured by Marsh in his 'Monograph of the Dinocerata,' pls. xv.–xviii.

Presented by Professor O. C. Marsh, 1885.

Tinoceras longiceps, Marsh [2].

Hab. North America.

M. 2094. Cast of the mandible and the upper canine. The original is from the Bridger Eocene of Wyoming, U.S.A.; and is figured by Marsh in the 'Monograph of the Dinocerata,' p. 37, fig. 38. *Presented by Professor O. C. Marsh*, 1885.

[1] Fifth Ann. Rep. U. S. Geol. Surv. p. 261 (1884).

[2] Fifth Ann. Rep. U. S. Geol. Surv. p. 275 (1884).

Genus **DINOCERAS**, Marsh [1].

Including *Octotomus*, Cope [2].

Dentition :— (usually) I. $\frac{0}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{3}$, M. $\frac{3}{3}$.

The base of the upper canine is nearly vertical, the cervical vertebræ are longer than in *Tinoceras*, and the lunar articulates with the trapezoid.

Dinoceras laticeps, Marsh [3].

Syn. *Octotomus laticeps*, Cope [4].

Hab. North America.

M. 2060. Cast of the mandible. The original is from the Bridger Eocene of Wyoming; and is figured by Marsh in the 'Monograph of the Dinocerata,' pl. xiii.

Presented by Professor O. C. Marsh, 1885.

Dinoceras mirabile, Marsh [5].

Syn. *Uintatherium mirabile*, Cope [6].

The mandible is unknown.

Hab. North America. The originals of all the following specimens were obtained from the Bridger Eocene of Wyoming, and are figured in Marsh's 'Monograph of the Dinocerata.' All the casts were presented by Professor O. C. Marsh, 1885.

M. 2058. Cast of the cranium.

M. 2059. Cast of the brain-cavity.

M. 2072–76. Casts of the bones of the fore limb.

M. 2081–83–89. Casts of the bones of the hind limb.

M. 2087–88. Cast of the left astragalus and calcaneum.

M. 2062–71. Casts of the anterior vertebræ.

M. 2082. Cast of the sacrum.

M. 2090–91. Casts of two caudal vertebræ.

M. 2077–81. Casts of four ribs.

[1] Amer. Journ. ser. 3, vol. iv. p. 344 (for Oct., published in advance Sept. 27, 1872).
[2] Amer. Nat. vol. xix. p. 44 (1885).
[3] Amer. Journ. ser. 3, vol. vi. p 301 (Oct. 1873).
[4] Amer. Nat. vol. xix. p. 52 (1885).
[5] Amer. Journ. ser. 3, vol. iv. p. 344 (Oct. 1872).
[6] Rep. U. S. Geol. Surv. Terr. for 1872, p. 581 (1873).

ADDENDA.

Family RHINOCEROTIDÆ (page 90).

Genus **RHINOCEROS** (page 91).

Atelodine group (page 92).

Rhinoceros karnuliensis, Lydekker[1].

This is a small brachydont species, apparently allied to *R. etruscus* but presenting some approximation in the form of the mandibular symphysis to *R. bicornis*.

Hab. India (Madras).

M. 2955. Casts of the second and third left upper true molars, and part of the symphysis and right ramus of the mandible. The originals (which are the types) were obtained from the caves of Billa Surgam, Karnúl district, Madras, and will be described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. iv. pt. 2, pl. x.

Made in the Museum, 1886.

Incertæ sedis.

Rhinoceros, sp. *c.*

Hab. Formosa.

M. 2956. Fragment of a mandibular ramus and one half of the atlas vertebra; from Tertiary (?) beds in Formosa.

By exchange, 1885.

[1] Rec. Geol. Surv. Ind. vol. xix. part 2 (1886).

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